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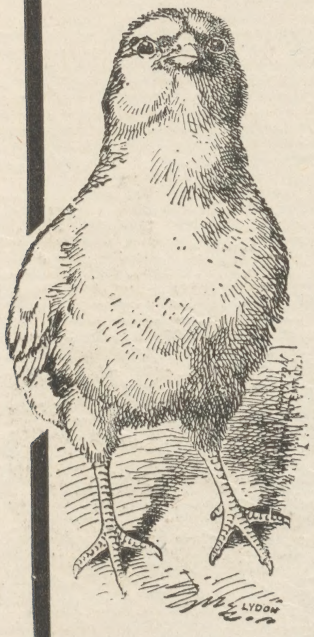

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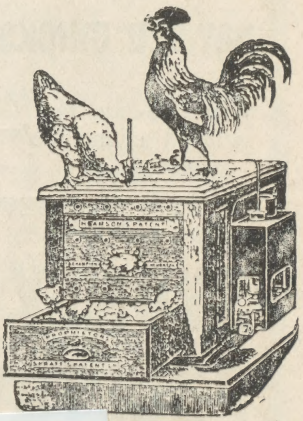

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Please see next page.

Please see previous page.

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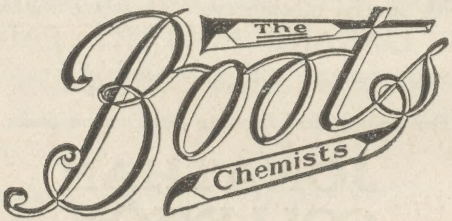

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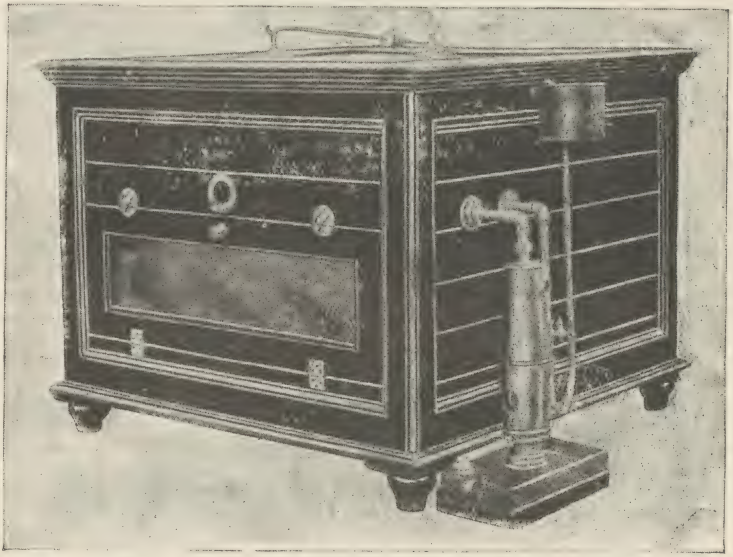

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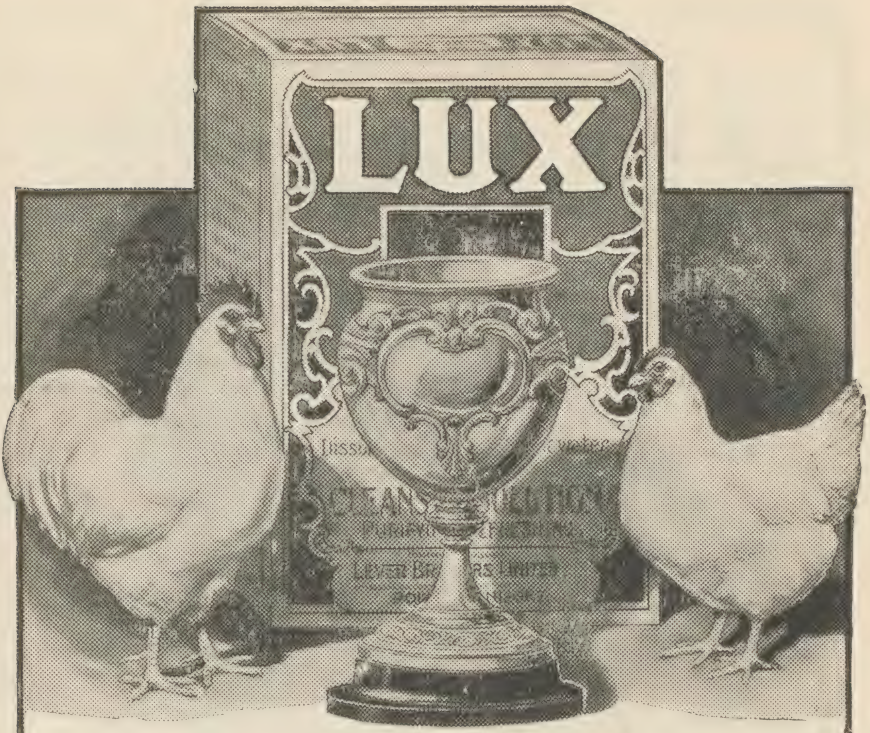

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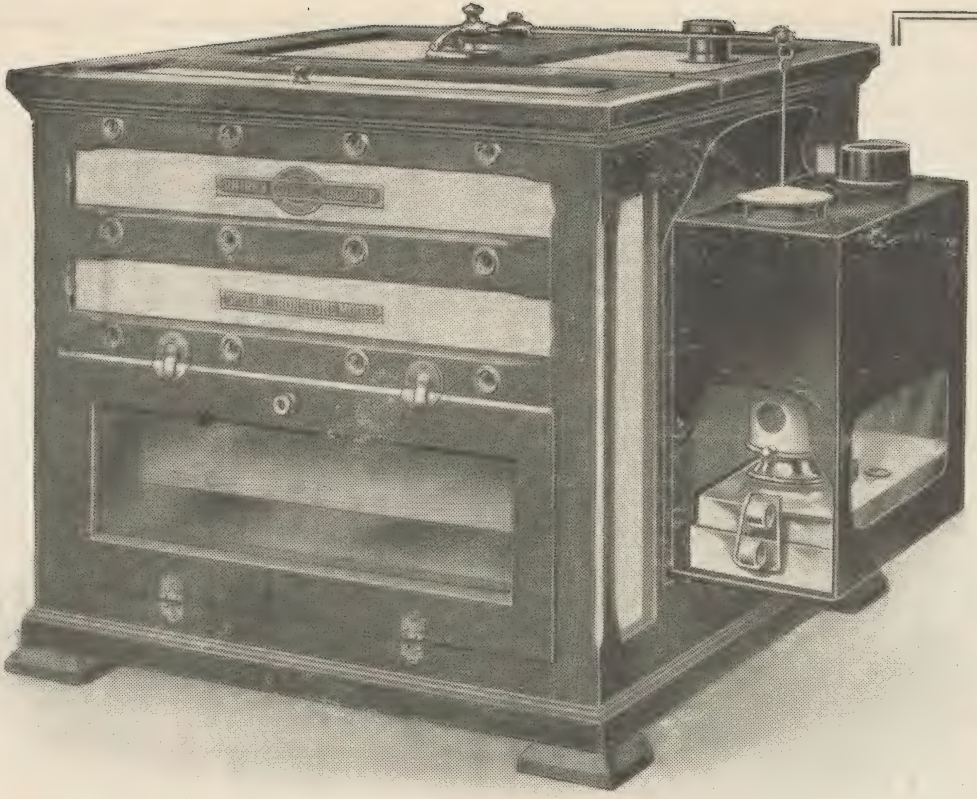

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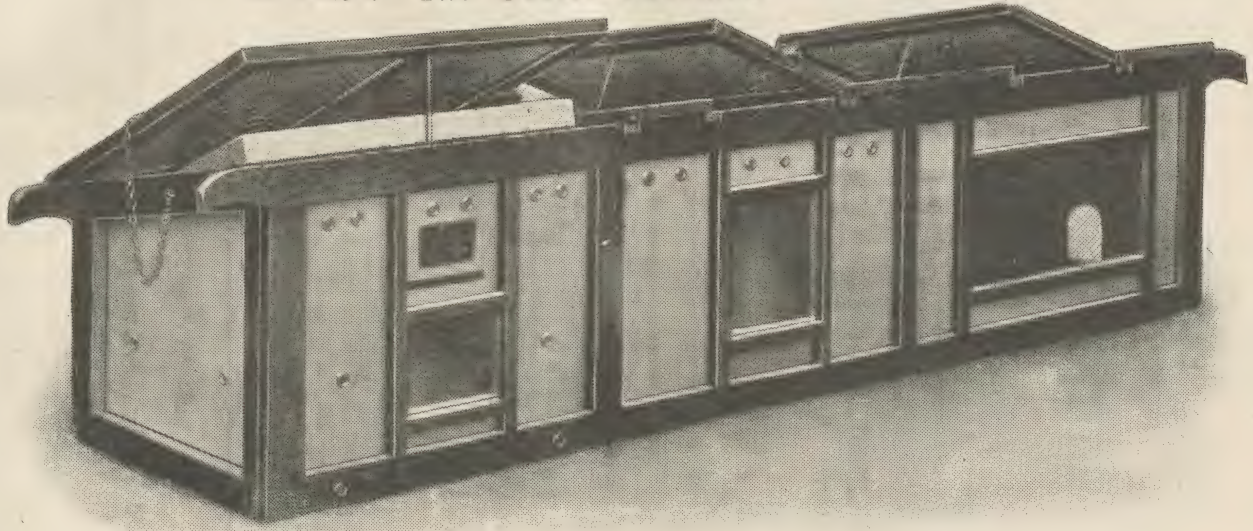

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First Published	*January,*	1916
Reprinted	*June*	1916
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PREFACE

ANOTHER volume on Poultry Culture! Yet does not this highly important subject merit it? After lying dormant for so very many years the Poultry Industry of the United Kingdom has suddenly "pipped" its shell and the little British hen is in the future to show what a busy-body she can be. Whereas poultry-keeping was previously looked upon as a *hobby*, it is from now to be regarded as a serious *business*. People do not ask "Do you keep poultry?" but "Do poultry keep you?" Nor are they concerned over "Will poultry pay?" but "How much will they pay?"

I have endeavoured to provide the reader with a sound *standard* text-book, in as many instances as possible touching upon details arising from special conditions. The cult of the domestic hen is very simple provided the recognised rules of the game are strictly adhered to, and a careful study of this work will, I hope, help the reader to discover the stepping-stones to success. The many pitfalls associated with the Industry are clearly pointed out, and with the aid of this book the wise poultry-keeper should succeed in avoiding them.

If this book inspires a greater respect for the little domestic hen my labours will not have been in vain.

W. POWELL OWEN.

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Under the entire personal management of WILLIAM H. COOK (eldest son of the late William Cook, Originator of the Orpingtons), "The well-known and reliable firm of Poultry Breeders and Exporters."

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FORTUNES FROM EGGS

HOW AN OUTLAY OF 52 SHILLINGS MADE £74

A MARVELLOUS EGG PRODUCING DISCOVERY.

If there is one thing more than another on which the average poultry keeper holds strong opinions, it is on the foolishness of forcing poultry to lay eggs during the time they fetch the highest price. That attitude is unquestionably the result of bitter experience with so-called egg-producers, which, though they stimulate the fowl for a time, have such a serious effect on the egg-producing organs of the bird that, after a little while, the fowl is practically useless for laying purposes, and may as well be killed off to save the expense of feeding.

That is the reason many thousands of poultry keepers condemn, off-hand, so-called poultry spices: pepper, cayenne, and other unnatural stimulants. And they are quite right in doing so.

FOWLS DO PAY.

But a new era has dawned for the poultry keeper, and it is now not a question of "Do fowls pay?"—they do pay, very handsomely indeed, and the profit to be made from them is only limited by the number of fowls kept. To many people that may seem a very startling assertion. But it is true.

COAXES—Does not force.

Karswood Poultry Spice copies nature. It contains ground insects. It is utterly and entirely different from any other spice on the market, being free from mustard and free from cayenne pepper.

A Wiltshire poultry keeper, whom we do not know, but who, after a thorough test of Karswood Poultry Spice, extending over seven months, achieved wonderful results, wrote as follows:—

The Banks, Lyneham,
nr. Chippenham,
4th August, 1914.

Dear Sirs,—I have been using your Karswood Poultry Spice since January 9th of this year, when I received the first 7-lb. tin from you.

I have about 150 fowl, chiefly White Leghorns. They have done splendidly this year, and I am very pleased indeed with the results obtained through using Karswood Poultry Spice. Of course they all get plenty of good food and careful attention. I am certain that if more of your spice was used there would not be so many complaints about poultry not paying.

I was on the point of selling all my stock, because they did not pay, but through using Karswood Poultry Spice they now pay splendidly.—Yours faithfully,

(Mrs.) M. Hale.

MONTHLY FIGURES.

Jan. ...	539	May ...	2,499
Feb. ...	1,260	June ...	2,139
Mar. ...	1,816	July ...	2,035
April ...	2,551		
		Total	12,839

52/- produced £74.

The actual cost of the Karswood Poultry Spice used by Mrs. Hale (eight 7-lb. tins at 6s. 6d. each) was £2 12s. The value of the 12,839 eggs obtained, worked out at the current prices prevailing, was £74 3s. 4d. Is it any wonder, therefore, that Mrs. Hale found her previous loss turned into a handsome profit? And Karswood Poultry Spice will do the same for your birds as it did for Mrs. Hale's.

SIZES and PRICES.

Note the Economy.

2d. packet supplies	12 hens	7 days.
6d. packet supplies	20 hens	16 days.
1/- packet supplies	20 hens	32 days.
7-lb. tin supplies	140 hens	32 days.
14-lb. tin supplies	280 hens	32 days.
28-lb. tin supplies	560 hens	32 days.

Boxes, 2d., 6d., 1/- each; 7-lb. tins, 6/6; 14-lb. 12/-; 28-lb. 22/6.

SOLE MANUFACTURERS:

E. GRIFFITHS HUGHES (KARSWOOD) Ltd., 855, Deansgate Arcade, Manchester.

POULTRY-KEEPING ON MONEY-MAKING LINES.

CHAPTER I

Our Home Poultry Industry: Past, Present, and Future.

Past neglect—Egg statistics—Our egg and poultry imports—The European War—Reduction of poultry stocks in Europe—Likely egg and poultry famine—Production v. *consumption in the U.K.—Present* v. *possible number of fowls in the U.K.—Each county's duty—From importers to exporters—The foreign egg—Loss of millions of eggs—Ireland can help—The future—Solving the poultry problem.*

AS a rule the average reader neither cares for, nor troubles to digest, *statistics*, and it is only due to the importance of the figures as affecting directly our "Home" Poultry Industry that I intend devoting a chapter entirely to this all-important subject. I propose serving up my menu in as interesting a way as possible, dealing with the egg and poultry statistics more fully than has been done in any previous textbook. Just as the angler baits up the swims before "dipping" his line in earnest, so do I intend this chapter to act as a little ground-bait before "wetting" my pen on the *practical* side of the Poultry Industry.

Past Neglect.—It has for many years past been a matter of surprise and regret to me that a number of our more deserving Home Industries have not been given their due respect. Especially has this been the case with the Poultry Industry, and the blame lies as much with the powers that be as with the British people. Here we have a self-supporting industry that has offered "home" producers a *bonus* of no less than £10,000,000 a year had they been eager enough to step in and produce *more and better poultry*. I refer to the huge amount of money spent yearly in poultry imports from foreign countries, totalling in 1913—the record year—almost as much as the products of our own little Biddy realised. It is to show British poultry-producers the best methods of "cornering" those ten millions that this textbook has been prepared.

Egg Statistics.—It is estimated that the United Kingdom consumes 5,000,000,000 eggs in a year, more than half of which is imported

into these Isles. In other words we might say that each head of population accounts for an average of some 110 eggs per annum—less than one egg every third day. *Great Britain consumes over twelve million eggs every day of the year, whilst Greater London alone uses up over two millions—about* 115 *tons—each day. Before the European War we were spending* £26,000 *a day on imported eggs, no less than* £182,000 *a week.*

Our Egg and Poultry Imports.—It will be as well for me to touch upon, in this chapter, our imports of eggs and poultry. From the table given below it will be seen that even as far back as 1893 we spent over £4,000,000 on poultry produce from abroad. It will also be noticed that the figures have been increasing each year until the record was reached in 1913.

	Eggs.	Poultry.		Eggs.	Poultry.
	£	£		£	£
1893 ..	3,875,639 ..	521,064	1905 ..	6,812,436 ..	905,791
1895 ..	4,003,446 ..	544,644	1906 ..	7,098,122 ..	869,114
1897 ..	4,356,807 ..	657,653	1907 ..	7,135,530 ..	903,847
1899 ..	5,044,392 ..	706,765	1908 ..	7,183,112 ..	934,679
1901 ..	5,495,767 ..	881,682	1909 ..	7,235,302 ..	920,699
1903 ..	6,617,599 ..	1,202,288	1911 ..	7,965,609 ..	918,197
1904 ..	6,730,574 ..	1,089,145	*1913 ..	9,590,602 ..	955,239

The European War.—Whilst the value of our poultry imports has been increasing each year, British poultry producers have certainly not been altogether idle. They have plodded on, but unfortunately on the same old lines, whereas a more progressive campaign backed up by the powers that be should have long since been put into operation. 'Tis true that of late the British hen has been taking things rather more seriously. She has travelled all over the globe to meet in open Laying Contests the world's best layers, and what is more, she has brought back honours, beating all comers. Again the world's egg-record for four winter months is held by six "all-English" White Wyandottes, which laid 523 eggs in the 112 days. In time to come progeny from these heavy-laying strains will find their way all over the United Kingdom, and the result will be to the advantage of our Industry. This amply shows that we have the goods, and the authorities might have done worse than "commandeered" (at the owners' prices) the original parents or close relatives of some of these noted layers and acted as distributing agents of eggs and stock.

The Poultry Press has at the beginning of each year given a detailed account of the previous year's imports of eggs and poultry, but the fact that we were spending over ten millions on foreign poultry produce did not seem to make things move any quicker. Then came the Great European War (August, 1914), which alone was the means of calling immediate attention to the excessive amount given yearly to foreign

* The record year.

producers. We suddenly "discovered" that those countries engaged in the struggle were the very ones that we mostly depended upon in peace-time for our poultry imports. The following table gives the number of eggs—in great hundreds (120)—imported in the record year of 1913 from the countries affected by the European crisis :—

	Gt. Hundreds (120).		Gt. Hundreds (120).
Russia	11,453,277	Austria-Hungary ..	883,651
Germany	513,740	Bulgaria	3,600
Belgium	72,879	Serbia	4,512
France	702,281	Rumania	226,190
Italy	845,789	Total	14,579,950

These eggs would be valued at about £7,000,000—something like two-thirds of our total imports.

All went well for a time, as eggs came into this country in decent quantities. Suddenly, however, Russia stopped her exportation of poultry produce—over 824 million eggs per annum—and other countries followed suit. They naturally (in war-time) wanted all the eggs and poultry their producers could supply for consumption at home. America and our Colonies helped to fill the gap, but the decreased import of eggs during the first six months of 1915 will be seen from the following table :—

	Number.		Value.
1914	1,232,758,320 ..	.. ..	£4,393,171
1915	546,374,160 ..	.. ..	£2,404,227
Decrease ..	686,384,160 ..	.. ..	£1,988,944

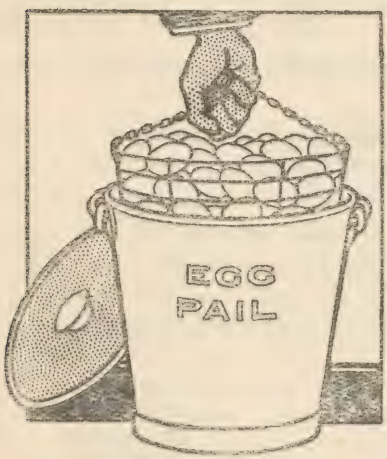
Had not war been declared the "import" figures of 1914 would undoubtedly have beaten those of 1913—the record year. In the following table are given the quantities of imported eggs from January 1st to July 31st—the ante-war months of 1914—and also the figures of 1913 for the same period, just to show that the imports were still going up and up :—

EGGS (IN GREAT HUNDREDS) IMPORTED FROM JANUARY 1ST TO JULY 31ST, 1914.

From	1913.	1914.	From	1913.	1914.[1]
Russia ..	5,290,453	4,993,168	Italy ..	580,536	800,910
Denmark ..	2,267,474	2,097,977	Austria-Hungary	655,820	908,546
Germany ..	280,133	405,390	Other countries	1,394,922	1,457,400
Netherlands ..	683,519	873,807			
France ..	505,547	486,125			
			Totals (in great hundreds) ..	11,658,404	12,023,323

Reduction of Poultry Stocks.—Soon after the declaration of war the prices of poultry foods began to rise, and in consequence far too many *so-called* experts recommended a ruthless reduction of poultry

stocks at home. This was a mistaken policy, for it only scared producers. I agreed to the immediate disposal of surplus stock—such as unnecessary male birds of all ages and old, unprofitable hens, for I have given this advice each year. I certainly think, therefore, that had many of the poultry experts gone into fuller details as to the whys and wherefores poultry-keepers would have had a better chance. At the time of writing there are rumours of a likely egg-famine, and the reduction of poultry stocks at home is given as the cause. I will, however, deal with this later on. What concerns us here is the reduction of poultry stocks abroad. Wherever the Hun has planted his heel little "biddy" has found her way into the stew-pot. Belgium, Northern France, Hungary, Galicia, etc., have been literally "swept" of the little domestic hen, and Wilhelm II. has even "officially" reduced the poultry stocks of his own subjects (in Germany) from some seventy million fowls (before the war) to practically nil. When, too, Warsaw fell, the Polish peasants lost all their geese and poultry stocks to the hungry Hun. This reduction of poultry stocks must seriously affect poultrydom in the near future, and at least calls for a combined effort on the part of poultry-producers to set their house in order. *With the high price of meat poultry have been found a cheap and popular substitute, which must have reduced the poultry stocks of the world still further.*



EGG-PRESERVING PAIL.

Likely Egg and Poultry Famine.—Rumour in well-informed channels has it that the United Kingdom must suffer from an egg and poultry famine, and this momentous question is certainly worthy of immediate attention on the part of Home producers. Those who have so far dealt with the question have not gone very fully into the subject. Years ago the "new-laid" was not held in such high esteem as a table dainty as it is to-day. We have suddenly entered into an egg-eating age, which fact must be borne in mind when dealing with the rumoured egg famine. America at one time was a big "exporter" of eggs, but of recent years she has realised what is in an egg and has "imported" supplies from Europe to meet her demand. A similar change has taken place in other countries, and *I have not the least doubt that ere long the demand for eggs and poultry in each country will have to be met by producers in that country.* This is far from what is now the case, for the present yearly production of eggs and poultry in the U.K. may

ENGLAND AND WALES: ITS POULTRY CAPACITY AND POSSIBLE PRODUCTION.

No. on map.	County.	P.F.	P.P. £
1	Northumberland	2,110,536	703,512
2	Cumberland	1,678,740	559,580
3	Durham ..	1,291,506	430,502
4	Westmorland ..	734,343	244,781
5	Nth. Riding	2,599,641	866,547
6	West Riding	3,539,700	1,179,900
7	Lancashire	2,381,043	793,681
8	East Riding	2,025,330	675,110
9	Cheshire ..	1,597,476	532,492
10	Derby ..	1,465,026	488,342
11	Nottingham	1,324,164	441,388
12	Lincoln ..	4,565,004	1,521,668
13	Flint ..	379,920	126,640
14	Denbigh ..	789,732	263,244
15	Carnarvon	514,230	171,410
16	Merioneth	452,397	150,799
17	Shropshire	2,149,695	716,565
18	Stafford ..	1,779,393	593,131
19	Leicester ..	1,422,285	474,095
20	Rutland ..	261,378	87,126
22	Norfolk ..	3,205,920	1,068,640
23	Montgomery	818,829	272,943
24	Cardigan ..	782,565	260,855
25	Radnor ..	483,450	161,150
26	Hereford ..	1,344,930	448,310
27	Worcester	1,194,945	398,315
28	Warwick ..	1,479,678	493,226
29	N'thampton	1,681,671	560,557
30	Huntingdon	625,932	208,644
31	Cambridge	1,473,747	491,249
32	Suffolk ..	2,277,825	759,275
33	Pembroke	923,721	307,907
34	Carmarthen	1,321,077	440,359
35	Brecknock	605,475	201,825
36	Glamorgan	792,183	264,061
37	Monmouth	714,720	238,240
38	Gloucester	1,966,134	655,378
39	Oxford ..	1,235,868	411,956
40	Buckingham	1,187,061	395,687
41	Bedford ..	765,828	255,276
42	Hertford ..	976,260	325,420
43	Essex ..	2,378,775	792,925
44	Wiltshire ..	2,174,238	724,746
45	Berkshire ..	1,052,721	350,907
46	Midd'esex	270,528	90,176
47	London ..	24,306	8,102
48	Kent ..	2,210,253	736,751
49	Surrey ..	779,046	259,682
50	Hampshire	2,072,214	690,738
51	Somerset ..	2,558,379	852,793
52	Devonshire	3,622,671	1,207,557
53	Cornwall ..	1,833,348	611,116
54	Dorset ..	1,432,833	477,611
55	Sussex ..	1,970,187	656,729
57	Anglesey ..	447,612	149,204
58	Isle of Man	278,544	92,848

be put at £15,000,000, whereas the total consumption is about £27,000,000 per annum, leaving about £12,000,000 to be spent each year on imported poultry produce.

Production *v.* Consumption in the U.K.—The nearest cut, then, to preventing an egg and poultry famine at home is for poultry-producers in the U.K. to supply the demand. This is an easy step! The United Kingdom can only boast of a mean average of less than half a fowl per acre of cultivated land,—the statistics being taken for holdings of one acre and upwards,—yet it has been proved that three fowls per acre could be kept without any displacement of other stock. *If each county in our Isles carried its full number of poultry stock the possible production would stand at something like* £50,000,000, *and as the total consumption is but* £27,000,000 *this would leave a good margin, and place us in a position even to export eggs.*

There is no reason why, once the poultry stocks of the U.K. were improved (and there is at present much room for improvement), the production should not be £100,000,000 per annum. It will surprise readers to know that there are but one or two counties where the yearly production exceeds the value of eggs and poultry consumed each year in that county. Shropshire, Cardiganshire, and Anglesey fall in line here, as the following table shows :—

	Yearly production.	Yearly consumption.	Excess.
	£	£	£
Cardiganshire	57,026	40,384	16,642
Shropshire	187,218	141,626	45,592
Anglesey	36,832	17,680	19,152

Wales alone spends over a million and a half pounds per annum on foreign eggs! Her present yearly production is only £567,961, *yet if she carried her correct number of fowls she could produce eggs and poultry to the value of* £3,000,000. As may be seen at a glance, no egg famine could be feared in Wales if she produced her maximum amount.

I have not room to give figures for all the counties, but to show how behind the times are producers in the U.K., I append a table giving the yearly production and consumption of eggs and poultry of a number of counties taken at random :—

	Yearly production.	Yearly consumption.		Yearly production.	Yearly consumption.
	£	£		£	£
Cumberland ..	152,781	156,196	Staffs.	170,119	842,664
Cornwall ..	151,442	180,453	Beds.	63,096	122,527
Somerset ..	210,104	228,447	Surrey	81,701	644,011
Wiltshire ..	148,310	168,508	Glamorgan ..	70,483	664,267
Hertfordshire ..	84,320	194,575	Cheshire ..	159,367	620,606
Essex	227,249	663,659	Lancashire ..	256,117	3,136,307
Sussex	273,076	416,773	Carnarvonshire	42,367	85,767
Kent	221,683	663,627			

If, on the other hand, each of the above counties kept its "possible" number of poultry stock, the amount of yearly production would be something approaching the figures given in the table below :—

	Possible yearly production. £		Possible yearly production. £
Cumberland	559,580	Staffs.	593,131
Cornwall	611,116	Beds.	255,276
Somerset	852,793	Surrey	259,682
Wiltshire	724,746	Glamorgan	264,061
Hertfordshire	325,420	Cheshire	532,492
Essex	792,925	Lancashire	793,681
Sussex	656,729	Carnarvonshire	171,410
Kent	736,751		

The above figures are on the light side and are only for holdings of an acre or more. Ten per cent. must be added for holdings under an acre, and the manurial value must not be omitted. The manurial value would amount to : Kent, £122,792 ; Sussex, £109,455 ; Essex, £132,154, etc.

Present and Possible Number of Fowls.—In touching upon the number of fowls in Great Britain we must go back to the last census of poultry taken in 1908. The *breeding stock* of the country then may be said to have consisted of :—

	Fowls.	Ducks.	Geese.	Turkeys.
England	13,774,000	741,000	172,000	146,000
Wales	1,240,000	103,000	69,000	26,000
Scotland	2,429,000	185,000	12,000	27,000
Great Britain ..	17,443,000	1,029,000	253,000	199,000
*Ireland	11,806,000	2,098,000	456,000	176,000

At three fowls to the acre the "possible" number of fowls that could be kept in the United Kingdom is given below, also a rough estimate for Ireland :—

England	73,436,000	Scotland	14,538,000
Wales	8,312,000	Ireland	44,000,000

Total number of fowls for the U.K. 150,286,000

* The above table includes the Census for Ireland taken in 1912.

The value of the present and possible production of the United Kingdom is given below :—

	Present Prod. £		Possible Prod. £
England	5,482,687	.. .. ..	24,367,509
Wales	567,961	.. .. ..	2,746,495
Scotland	1,076,890	.. .. ..	4,786,181
Ireland	5,744,250	.. .. ..	14,742,766
Present total ..	12,871,788	Possible total..	46,642,951

If we add two million pounds for small occupations, we may be said to produce at home poultry supplies to the value of £15,000,000.

The table appearing below gives the number of fowls at present kept in the county quoted, and for the sake of comparison the "possible" number. The counties named have been taken at random :—

	Present.	Possible.		Present.	Possible.
Sussex	547,353	1,970,187	Essex	549,944	2,378,775
Staffs.	602,902	1,779,393	Cardigan.. ..	185,048	782,565
Surrey	183,617	779,046	Derbyshire ..	436,152	1,465,020
Beds.	195,460	765,828	Leicestershire ..	260,457	1,422,285
Kent	564,283	2,210,253	Lincolnshire ..	243,202	4,565,004
Shropshire ..	486,774	2,149,695	Notts.	241,980	1,324,164
Cornwall.. ..	441,568	1,833,348	Rutland	47,740	261,378
Glamorgan ..	187,953	792,183	Lancashire ..	919,910	2,381,043
Somerset ..	612,573	2,558,379	Cheshire	573,285	1,597,476
Wiltshire ..	458,278	2,174,238	Anglesey.. ..	107,448	447,612
Hertfordshire ..	226,725	976,260	Carnarvonshire ..	124,146	514,230
Cumberland ..	595,600	1,678,740			

Replacing Imported Manures.—The high value of poultry manure is well-known, and in keeping an increased number of poultry stock we should have to regard the manurial value—roughly 3*s.* 4*d.* per acre—as well as the increase in the production of poultry supplies. We should then have the following manurial values :—

	£
England	4,079,737
Wales	461,733
Scotland	807,639
Total	£5,349,109

This is worth attention, for we spend something like £3,000,000 a year on "imported" manures.

Each County's Duty.—I am so confident in my assertion that Great Britain must carry her correct number of fowls if her Home Poultry Industry is to hold the position it should that I give below the possible number of fowls that can be kept in the various counties, with the

possible value of produce.* The production figures do not include the value of manure, which has already been dealt with collectively.

ENGLAND.

Division Ia.	Possible number of fowls.	Possible value of produce. £
Bedford ..	765,828	255,276
Huntingdon	625,932	208,644
Cambridge ..	1,473,747	491,249
Suffolk ..	2,277,825	759,275
Essex	2,378,775	792,925
Hertfords. ..	976,260	325,420
Middlesex ..	270,528	90,176
London ..	24,306	8,102
Totals (Div. Ia.)	8,793,201	£2,931,067

Division Ib.	Possible number of fowls.	Possible value of produce. £
Norfolk ..	3,205,920	1,068,640
Lincoln ..	4,565,004	1,521,668
Yorks (E. Rdg.)	2,025,330	675,110
Totals (Div. Ib.)	9,796,254	£3,265,418

Division IIa.		£
Kent	2,210,253	736,751
Surrey ..	779,046	259,682
Sussex ..	1,970,187	656,729
Berkshire ..	1,052,721	350,907
Hants. ..	2,072,214	690,738
Totals (Div. IIa.)	8,084,421	£2,694,807

Division IIb.		£
Notts. ..	1,324,164	441,388
Leicester ..	1,422,285	474,095
Rutland ..	261,378	87,126
Northants ..	1,681,671	560,557
Bucks. ..	1,187,061	395,687
Oxon	1,235,868	411,956
Warwicks. ..	1,479,678	493,226
Totals (Div. IIb.)	8,592,105	£2,864,035

Division IIIa.		£
Salop	2,149,695	716,565
Worcs. ..	1,194,945	398,315
Gloucester ..	1,966,134	655,378
Wilts. ..	2,174,238	724,746
Monmouth ..	714,720	238,240
Hereford. ..	1,344,930	448,310
Ttls. (Div. IIIa.)	9,544,662	£3,181,554

Division IIIb.		£
Somerset ..	2,558,379	852,793
Dorset	1,432,833	477,611
Devon	3,622,671	1,207,557
Cornwall ..	1,833,348	611,116
Ttls. (Div. IIIb.)	9,447,231	£3,149,077

Division IVb.		£
Cumberland ..	1,678,740	559,580
Westmorland ..	734,343	244,781
Lancs... ..	2,381,043	793,681
Cheshire ..	1,597,476	532,492
Derby	1,465,026	488,342
Staffs. ..	1,779,393	593,131
Totals (Div. IVb.)	9,636,021	£3,212,007

Division IVa.		£
Northumberland	2,110,536	703,512
Durham ..	1,291,506	430,502
Yorks (N. Rdg.)	2,599,641	866,547
Yorks (W. Rdg.)	3,539,700	1,179,900
Totals (Div. IVa.)	9,541,383	£3,180,461

* For these figures acknowledgments are due to my friend Mr. Edward Brown, an accepted authority on the matter.

WALES.

Division Va.	Possible number of fowls.	Possible value of produce. £
Anglesey ..	447,612	149,204
Carnarvon ..	514,230	171,410
Merioneth ..	452,397	150,799
Montgomery	818,829	272,943
Denbigh ..	789,732	263,244
Flint	379,920	126,640
Totals (Div. Va.)	3,402,720	£1,134,240

Division Vb.	Possible number of fowls.	Possible value of produce. £
Cardigan ..	782,565	260,855
Radnor ..	483,450	161,150
Brecon ..	605,475	201,825
Glamorgan ..	792,183	264,061
Carmarthens.	1,321,077	440,359
Pembroke ..	923,721	307,907
Totals (Div. Vb.)	4,908,471	£1,636,157

SCOTLAND.

Division VIa.		£
Nairn ..	75,828	25,276
Elgin or Moray	298,734	99,578
Banff ..	479,550	159,850
Aberdeen ..	1,885,791	628,597
Kincardine ..	358,536	119,512
Forfar ..	746,031	248,677
Perth ..	1,005,765	335,255
Clackmannan	46,683	15,561
Kinross ..	104,094	34,698
Fife	754,458	251,486
Ttls. (Div. VIa.)	5,755,470	£1,918,490

Division VIb.		£
Linlithgow ..	172,253	57,751
Midlothian ..	377,802	125,934
Haddington ..	335,142	111,714
Berwick ..	575,373	191,791
Roxburgh ..	534,792	178,264
Selkirk.. ..	87,693	29,231
Peebles ..	149,619	49,873
Totals (Div. VIb.)	2,232,674	£744,558

Division VIIa.		£
Shetland ..	173,559	57,853
Orkney	324,528	108,176
Caithness ..	335,400	111,800
Sutherland ..	93,741	31,247
Ross and Cromarty ..	420,987	140,329
Inverness ..	450,549	150,183
Totals (Div. VIIa.)	1,798,764	£599,588

Division VIIb.		£
Argy	396,480	132,160
Bute	76,659	25,553
Dumbarton ..	146,688	48,896
Stirling ..	346,545	115,515
Lanark ..	762,156	254,052
Renfrew ..	266,130	88,710
Ayr	954,762	318,254
Dumfries ..	759,087	253,029
Kirkcudbright	573,450	191,150
Wigtown ..	467,640	155,880
Totals (Div. VIIb.)	4,749,597	£1,583,199

ISLANDS.

		£
Isle of Man	278,544	92,848
Jersey	58,920	19,640
Guernsey, etc. ..	34,638	11,546
Totals (Islands) ..	372,102	£124,034

The above production figures are on the light side, and are for holdings of an acre or more. They do not include manurial values.

From Importers to Exporters.—The time has arrived for poultry producers in the United Kingdom to set their poultry house in order. If they can produce eggs and poultry to the yearly value of £50,000,000, they will place this country in a sound position. Then not a single egg or table chicken need be imported, and, moreover, a good "export" business in poultry produce will be established. The United Kingdom is admirably placed, and the climate is a good one for poultry. What more could be asked for?

The Foreign Egg.—One may ask: Why has the imported egg secured such a hold? The answer is that we have never stocked sufficient poultry to supply the demand. *Foreign eggs have always held an advantage over "home" supplies in that they* (1) *could be had in any quantities,* (2) *came to hand nicely graded in size and colour,* (3) *were up to sample,* (4) *were nicely packed,* (5) *quantities could be had at early notice,* (6) *came for the most part from producers who preached and practised organisation and co-operation.* They have, on the other hand, had the disadvantage that supplies could not be sent over in less than four days, and only in this short time from countries near at hand. Owing to our own producers, however, marketing their eggs at irregular times, foreign eggs from many countries have in the past been able to compete on equal terms with the "English" eggs. There must, therefore, be a general speeding up from the time the egg drops into the nest till it arrives on the breakfast-table.

Loss of Millions of Eggs.—I am not going to shut an eye to the loss of millions of eggs each year due to the carelessness of "home" producers. Such, however, would be remedied if the powers that be provided adequate instruction in Poultry Husbandry. American producers have just learned from their experts that they lose £9,000,000 a year by careless egg-handling on their poultry farms. Poultry-producers this side the Atlantic keep far too many hens that are wasters or too old to show a profit. The poultry stock on all farms should consist of half pullets and half young hens. Egg-eating, the laying of soft-shelled eggs (through lack of grit), and other vices rob the National egg-basket. *Individual producers lose many hundreds of eggs each year through* (1) *allowing the broody hens to be with their chickens too long,* (2) *not getting a goodly number of eggs from the hens that have rested with chickens before disposing of them,* (3) *allowing their layers to take too long over the moult,* (4) *not speeding up the young pullets to ensure their laying* directly *they are matured,* (5) *late-hatching,* (6) *not growing the young stock into large, well-matured birds due to bad feeding and management,* (7) *breeding from inferior stock,* (8) *allowing hens to waste time when broody, instead of curing them of this fever quickly.* These and many other points directly touching upon the question under consideration will be especially dealt with in this volume.

SCOTLAND: ITS POULTRY CAPACITY AND POSSIBLE PRODUCTION.

No. on map.	County.	P.F.	P.P. £
1	Caithness ..	335,400	111,800
2	Sutherland	93,741	31,247
3	Ross and Cromarty	420,987	140,329
4	Nairn ..	75,828	25,276
5	Elgin ..	298,734	99,578
6	Banff ..	479,550	159,850
7	Inverness ..	450,549	150,183
8	Aberdeen ..	1,885,791	628,597
9	Forfar ..	746,031	248,677
10	Kincardine	358,536	119,512
11	Perth ..	1,005,765	335,255
12	Argyll ..	396,480	132,160
13	Fife ..	754,458	251,486
14	Stirling ..	346,545	115,515
15	Kinross ..	104,094	34,698
16	Clackmannan	46,683	15,561
17	Linlithgow	172,253	57,751
18	Renfrew ..	266,130	88,710
19	Edinburgh	377,802	125,934
20	Haddington	335,142	111,714
21	Berwick ..	575,373	191,791
22	Peebles ..	149,619	49,873
23	Selkirk ..	87,693	29,231
24	Roxburgh ..	534,792	178,264
25	Ayr ..	954,762	318,254
26	Dumfries ..	759,087	253,029
27	Kirkcudbright ..	573,450	191,150
28	Wigtown ..	467,640	155,880
29	Dumbarton	146,688	48,896
30	Lanark ..	762,156	254,052
40	Bute ..	76,659	25,553

Ireland can Help.—Ireland can greatly help the Poultry Industry of the United Kingdom. She has done well in the past, her present yearly production being more than that of England, and totalling £5,744,250. A census of poultry in Ireland taken in 1912 showed that in that year her breeding stock was 11,806,000 fowls. Her producers pay strict attention to details, making in 1913 over £42,600 from the export of feathers. Market salesmen, too, in London and the principal English markets are full of praise for the method of packing and despatch of eggs as adopted by the Irish poultry-producer.

The Future.—There never was a better time than the present for Poultry Culture, which must now be regarded as a National Industry, and not as a "hobby," as so many have looked upon it in the past. *We want more and better poultry.* Eggs and poultry have never fetched such high prices as during 1915, and there must be no more sitting on the fence and doing nothing. After the war the poultry stocks of Europe, reduced by the Kaiser as previously mentioned, will have to be replaced, and as we have the advantage in being "right on the spot," our producers will undoubtedly be called upon to supply breeding stock. *Every British producer should raise as many chickens as possible in the near future to ensure for Great Britain the control of her own egg and poultry markets.* Backyarders, suburbanites, small holders, general farmers, poultry-farmers, etc., can all help in this direction.

Solving the Poultry Problem.—As I write a Government Egg and Poultry Demonstration Train has been touring the Western Counties —the first, I believe, that has been sent on its way to poultry producers in England, although Wales has been well-treated as regards such trains. We can do with more Demonstration Trains and more official poultry experts. In America these Demonstration Trains are very popular. If the Government took up the question now and popularised the Poultry Industry, telling producers what was wanted, and how best to go about things, we should soon have matters righted. Recently in one of our leading London dailies I outlined a scheme whereby the poultry problem could be solved. I suggested that in addition to making each county supply its own demand, the Government should establish a demonstration farm in each county in charge of at least two poultry experts, who would devote their whole time to travelling the county giving lectures and demonstrations. A receiving and distributing depôt would be run in conjunction with each farm, and motor-lorries would go out twice or more a day to collect eggs from the farmers and deliver supplies to the shopkeepers, etc. Both farmer and shopkeeper would be persuaded to have a monetary interest in the scheme. There would be a "local supply for local demand." Instead of Somerset producers sending eggs all

the way to London or Lancashire, as is now so often the case, her surplus supplies would be sent into Wales, for instance, and other places nearer home. Wales spends over a million and a half pounds a year on foreign eggs, which amount could well go to her own producers, or those near her border line, and so on. Cumberland and Shropshire would be asked to increase their outputs to the full to supply the gap caused by Lancashire consuming so much more poultry produce than she supplies. By this scheme of local supply for local demand, as I pointed out, each egg could be "motor-lorried" from the hen's nest to the breakfast-table within twenty-four hours of its being laid. *There is, indeed, a bright prospect in front of the Poultry Industry of the United Kingdom, but the best that every producer can give is needed without delay. Let producers aim at* (1) *more and better poultry,* (2) *better egg-records,* (3) *more scientific breeding,* (4) *more scientific housing and feeding, and* (5) *a keener attention to detail.*

CHAPTER II

Branches of Poultry Husbandry.

The fancier—The utilitarian—Eggs for sitting trade—Eggs for market—The preservation of eggs—Day-old Chicks and Ducklings—Raising table chickens and ducklings—The general farmer—Poultry for the small holder—Geese, Turkeys, Guinea Fowl and Bantams.

IN this chapter, for the guidance of my readers, I propose touching briefly on the various branches of Poultry Husbandry. Equipped with a little knowledge of the subjects dealt with, the reader will be the better able to grasp the hints given in subsequent chapters.

I. The Fancier.

Far too many utility poultry-keepers argue that the Poultry World could do without the fancier, who spoils the laying qualities of any breeds he takes up. This is to be regretted, for although the fancier strives to breed chiefly for perfect shape and plumage, he is all the time improving the breeds of poultry and keeping them up to a high standard of perfection. I quite admit that certain breeds have been ruined by reason of the fancier's touch in breeding for "exhibition" points at the expense of laying qualities, but there are others that the fancier could not spoil. Take the case of the Rhode Island Red or the Sicilian Buttercup, or even La Bresse! The standards for these breeds have been most carefully framed on "utility" lines, and so the fancier and the utility man breed to the same standard. This example might, of course, be followed for other breeds to advantage. There is not the least doubt that the fancier is responsible in the early stages of a breed's career for that variety's popularity. Had the Rhode Island Red not been taken up by the fancier when that noble breed came to our shores it would not have been so popular in both the Fancy and Utility Worlds as it is to-day. Again, the exhibition of prize-bred poultry appeals to all who have a liking for what is beautiful, and this tends to popularise Poultry Culture more than many people will admit. I do not wish in this defence of the fancier to advise readers who are breeding for the 300-egg-per-annum hen to purchase their male birds for their breeding pens from owners of purely

prize-bred fowls. That would be an erroneous proposition. I would, however, remind my readers that the fancier is doing good work in the World of Poultry and that there are some very prolific hens amongst those bred by the fancier for feather and type. Again, it is to the fancier that we look for new breeds, and he seldom disappoints, thus keeping up our interest in fowl matters.

The Fancy Farmer.—There is naturally more profit to be made from the rearing of exhibition poultry than from that of utility fowls. But, of course, the capital required is much more than for utility poultry-farming. Any amount from £500 to £1000 might be considered adequate capital; but, of course, experience is essential. The breeding of prize-poultry is an exact art, and success goes to the one who breeds winning birds. Where the owner has no experience he must employ a skilled poultry manager who has had experience in the breeding of those varieties specialised in. In addition to a good weekly wage —according to ability—it is advisable for the owner to offer his poultry-man a commission on wins at the shows and on sales of sittings of eggs, chickens, and stock-birds. Let him treat the poultryman with consideration and he will reciprocate to the full. Directly the business has been started the owner should take a really live interest in the birds, especially learning from his poultry-man all there is to know about the breeding, feeding, and management questions. The above would probably be the best method of starting for an owner without experience. Should he decide, however, to take practical lessons, a year or more on an up-to-date "exhibition" establishment, *where the same breeds that he admires are kept*, will teach him his A, B, C.

The Backyard Fancier.—The average suburbanite or backyard poultry-keeper treats the exhibition of prize-poultry as a "hobby," but not a few, where space permits, regard it as a profitable "business." The backyarder will find a £10 note quite sufficient to make a start with, and for this sum a high-class pen of exhibition birds could be purchased. The "exhibition" side-line need not deter the backyard fancier from keeping a pen of utility fowls to supply the house with new-laids. At some time or other the exhibition *fever* always comes over the backyard poultry-keeper, even if he starts with six fowls for *laying purposes only*. It usually owes its beginning to a visit to the "local" poultry show, and ere long he becomes a "local" to be feared at shows within, say, a twenty-five-mile radius. Those who argue that one must have plenty of fields for fowls to romp in if success is to be met with should dismiss such a mistaken argument from their minds. Let me say here that scores upon scores of Dairy and Palace winners have in the past been bred and reared in a backyard run. Scarcely a year passes but what backyarders' home-bred prize-fowls win high honours at the classic shows. Several cases of £50 and over paid by leading

exhibitors to backyarders for home-bred single specimens have come to my notice in recent years.

Small-holder and Utility Farmer.—One would not expect to see the Small-holder and the Utility Farmer included under this section, "The Fancier." Whilst I do not advise the Small-holder or the Utility Farmer to go in for prize-poultry on an extensive scale, I can assure him he will be well advised to "mix" it a little and stock one or two pens of exhibition birds in the breed or breeds he is interested in. This branch should be treated solely as an asset and accounts should be kept separately from those of his other lines. As regards breeding, too, the utility and exhibition strains should be kept distinct by the free use of leg-bands and never mated together.

Making a Start.—Specialising is the thing of the hour, and as in all branches of Poultry Husbandry, one must lay a sound foundation at the start. Rather have a few select birds than a number of inferior ones costing the same grand total. A high-class trio will see the backyard fancier on his way to success, and a tip-top trio in the several breeds to be specialised in will suit the exhibition farmer at the commencement. The vendor will mate up the birds if the purchaser is a tyro, and will render assistance in further matings. Do not make the very common mistake of stocking too many varieties. The backyarder must be content with one breed and the exhibition farmer with a few, although at the same time one or two of that number will be specialised in more than the rest. One man's choice might be for black-plumaged birds, in which case he would take up, say, Black Orpingtons, Croad Langshans, Black Minorcas, Black Leghorns, Black La Bresse, Black Wyandottes, etc. Then he might go further and add a few "miniatures," such as Black Rosecomb, Black Wyandotte, etc., Bantams. The man who might favour white-plumaged fowls would probably select White Wyandottes, White Orpingtons, White Leghorns, White Rocks, etc., and his Bantams might consist of White Wyandottes, White Rosecombs, etc. By adopting the above plan the fancier would have many strings to his bow. One point must be remembered, and that is for the tyro to commence with a variety that is easy to breed true to colour and type. A self-coloured variety is best at the start. There are many breeds that require separate pens for breeding exhibition males and females respectively (such as the Silver Laced Wyandotte and other laced and pencilled breeds), and these can be taken up later when the A, B, C of breeding has been mastered. The backyard fancier would naturally select a dark-plumaged variety as best fitting the surroundings, and I know of no better breed for him than the Black Orpington. One must, of course, study the breeds and select popular ones, as the returns will be better than where breeds that have had their day are taken up.

Finance.—Prices range high for exhibition birds, and of course it cuts both ways. Just as the beginner will be expected to pay high prices, so will he be sure of fine returns if he breeds the "goods." In the past anything from £20 to £100 has been paid for single specimens, and if the breeder is fortunate to turn out the bird of the year in its sex he will be sure of a good offer if he wishes to sell. Some noted sales I can recall include a Barred Rock hen for £75; the 1907 Royal Lancashire winning pullet (Barred Rock) for £40; the champion Barred Rock cockerel of 1907 for £50, again for nearly £100, and finally for £75, thus changing hands three times; a Buff Orpington pullet claimed at the Dairy Show in 1910 for £100, and the 1st and 2nd prize-winning Black Orpington cockerels at the Crystal Palace Show of 1907 for £50 each. The exhibitor must be prepared, as in any other Fancy—whether dogs, cats, rabbits, or pigeons—to start in a small way with select specimens and to improve the stock each year until the top rung of the ladder has been reached. It means years of careful breeding and management, but patience always brings its due reward until the owner finds himself in "clover." The novice must not err in selling his best birds, or he will have no foundation stone for future winners. My advice has always been: "Never part with a prize fowl, no matter how tempting the offer, *unless* you have an equally good bird at home." One can start with a £10, £20, or £50 trio, but the more one pays the quicker will he find himself at the top. In his wanderings around the shows the exhibitor with his eyes open will pick up many cheap bargains. A bird worth £10 or £20 may be catalogued at 10*s*. owing to the owner not knowing its value. The bird is "cardless," in a corner pen, and yet had the owner washed it properly it might have won its class. Remember, then, that under a dirty plumage may be found a £10 bird for 10*s*. As regards income from exhibition poultry, this naturally depends upon whether the owner's birds are winning at the shows and on their quality. A friend of mine recently confided in me that for many years he has made from £600 to £800 a year profit. His stock (young birds included) might be valued at £1000. Singularly enough, he only stocks *one* variety.

Harvests.—When the exhibition poultry-farmer has got his establishment into going order his harvests may be considered to be: eggs for sitting, newly-hatched chicks, high-class breeding stock—single birds, trios, and pens, etc. Early hatching is imperative, and he should plan for 1000 head of youngsters hatched on January 1st and after, all of which must be sold at good prices—except those retained for breeding—by the following November. Orders for sittings of eggs and day-old chicks (usually double the price of sittings) will be booked up in advance. Again, if his birds perform well at the yearly classic shows—Dairy, Palace, Birmingham, Manchester, Haywards Heath,

the Royal of England, Royal Lancashire, etc., etc.—export orders will be good, as the leading exhibitors abroad invariably send for catalogues of awards at these shows. Export orders act as splendid advertisements, and one can be sure of a few by advertising in foreign Poultry Journals. Do your best to give satisfaction and where possible send abroad for the standards of perfection for the various breeds, so that birds sent may fall in line as near as possible with them. American fanciers are excellent buyers on the British prize-bred poultry market, but unfortunately the standards for both countries are not identical, America occasionally requiring a darker coloured bird than our home fanciers aim at. However, the keen exporter will obtain copies of the American standards and put the birds ordered in charge of a well-known shipping firm. Export orders are easy to manage, and the *American does not mind what he pays so long as he gets what he wants.* The large exhibitor, too, can receive pupils at a profitable rate for premium and tuition.

On Showing.—Do not show any bird unless it is fully matured; do not overshow an exhibit, and do not disturb the breeding pens for the sake of a prize once they have been mated up. The shows are divided up into summer and winter events. At the summer shows competition is not always keen, and the tyro will take advantage of the fact. Chickens should be hatched out as early after January 1st as possible, as such birds can compete at the summer shows, where prizes are good. Incubators should be busy by the middle of December. Young birds of the current year's hatching are provided with classes at the summer shows, and at the winter shows everything is in full swing for birds of all ages, competition being then keen. Do not make the mistake of starting with the more important or classic shows. Commence at the smaller shows, local shows, or "limit" shows—where the catalogue price of each exhibit must not exceed £3, £5, or £10, as the case may be—and work upwards. Join the local societies, as these hold members' shows regularly and offer cups for competition amongst their own members. Become a member of the Poultry Club —the fanciers' official organ, and join the Specialist Clubs that foster the varieties you breed. Valuable trophies are offered members by the Specialist Clubs, and of recent years the novices have been exceedingly well catered for.

The poultry shows are advertised each week in the Poultry Papers, and postcards should be sent off to the secretaries of suitable events for schedules. When the latter arrive study them carefully and pay strict attention to the classification and the rules. Select shows where full prize-money is given, and where a class is provided for the *breed and sex* of the bird to be exhibited. Thus a class for White Wyandotte males (*i.e.* if the exhibit was a White 'Dotte cock) should

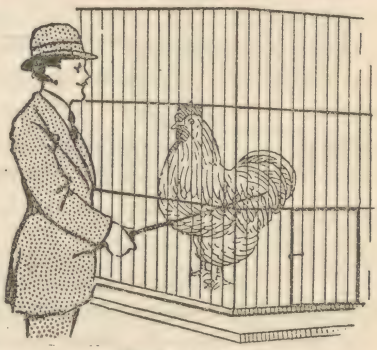
have the preference over a class for "Wyandottes: any colour and sex," or one for "White Wyandottes: any sex," as the bird would naturally have an equal chance against birds of its own colour, breed, and sex. With the schedule an entry form will be sent. Fill in the particulars thereon very carefully, putting the correct class number, breed, colour, and sex of bird and the amount you are prepared to accept for the exhibit and hamper. If you do not wish to sell the bird put N.F.S. (not for sale) in the proper column, but if you can spare it for £5, £10, or more, by all means put the price, as it frequently happens that a customer is found that way. See that you write your full name and address distinctly on the form, and then return the filled-in entry form with remittance to the secretary. Just before the show the secretary will send you a show label to tie to the hamper containing the exhibit; the secretary's address will be printed on one side, and you must write your full name and address on the reverse side.

Give the bird a good feed before despatch to the show, and send the hamper off in good time for it to reach the show by the time mentioned in the rules. When the bird arrives home from the show give it a good feed and pen it separately for a day or so before putting it with other stock, to make sure that it has not caught some infectious disease whilst at the show. A glance at the pocket inside the hamper will tell whether the bird has got a card or not, and even if it is only a v.h.c. (very highly commended) or a 4th, be a sportsman and say "Better luck next time." If the bird does not arrive home to time don't be hasty, but just wire the secretary (prepaid) and send a covering letter at night if no reply. Maybe the bird has been claimed at the show or by some mistake owing to rush of work packed off by a steward to another exhibitor. Don't worry, he will come home, even if he has gone astray, for mistakes in penning and despatching are unavoidable. When eventually returning the bird to its proper pen do it at night, by placing the bird on the perch with the other fowls. In the morning the chances are that the birds have not noticed the newcomer and there will be no bloodshed.

Training an Exhibit.—It is not always that the best bird wins, for no matter how excellent a specimen may be it will take second place (to another that is better shown and tamer) if it is badly shown or trained. No judge will stand in front of a pen and wait till a bird steadies itself if the things keep flying all over the pen and refuse to be handled. That is why the owner should pet his birds from the time they leave the egg-shells, as it were, so that they will show off their good points. Walk along a row of pens at a show and stroke the prize-winners with the judging-stick. They will sparkle up at once and hold their heads and tails up to perfection. The "warriors"

that have won many a first card will peck at the judging-stick, as if to say, "Here we are, here we are, here we are again."

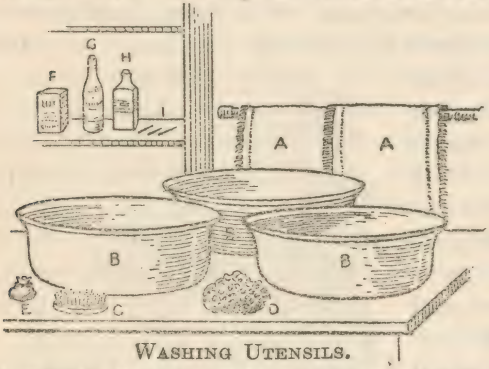
It is advisable, therefore, to train a bird before exhibiting it. A fortnight's training before the event would not be too long for some specimens, whereas seven days in the training camp would suit others. An ordinary wire enclosure (as used at the shows and sold cheaply by appliance firms) will act as a training pen. If a sliding bottom can be fitted thereto so much the better for cleaning purposes. A perch should be fitted up therein at night, for roosting purposes. Bed the pen down with sawdust, feed and water the bird well, and observe utter cleanliness. Be patient and for the first few days visit the bird at night by candlelight and handle it carefully. Train the bird to come and take a piece of meat out of your hand, and after a few days the bird will allow itself to be stroked and "touched up" with a thin twig or judging-stick. Give the bird whilst in training plenty of green food and occasionally bread and milk as a conditioning food. It is a good plan to boil a little linseed in water—half a pound to two quarts of water—and add the liquor to the soft food. This will impart a fine gloss to a bird's plumage.



IN TRAINING.

Washing an Exhibit.—Most prize fowls require a wash before being penned at the show. The process is simple and easily mastered, although the novice should first experiment on several birds before taking in hand a valuable specimen. The exhibition poultry farmer will have an up-to-date washing and drying house for his fowls on the farm. On one side of the house will be three basins fitted with hot and cold water taps and a sprayer, whilst at the end there will be a bench for the bird to stand on after leaving the third basin. On the other side of the room will be a row of pens with hot-water pipes passing underneath. After the bird has been washed he will be placed on a perch in one of the pens to get dry. The small man will make use of ordinary basins or tubs. Three tubs are required, and the scullery will make the backyarder's best washing-house. First tie a piece of string loosely round the bird's legs to prevent it from struggling. Fill tub No. 1 with warm water (comfortable to the hand), and make a good lather with "Lux." Place the bird in this tub and work the soap well into the feathers and fluff. After pressing out as much soap and water as possible pass the bird into tub No. 2, containing clean lukewarm water. Well rinse out the soap and the bird is then ready

for tub 3. The water in the third receptacle should first be "blued" if *white* birds are being washed, in order to keep the purity of the white. Tie a little blue in a cloth and move the bag about until the water is nicely blued; don't add loose powder or the sediment will "blue" the bird's legs and spoil everything. A little glycerine added to the water will help the feathers to web out soft. Use rain-water, if possible, for the tubs. After leaving tub 3 place the bird on a wooden slab and squeeze out all the water and dry off with towels. A sponge and brush will be necessary in the outfit. After being washed give the bird a warm feed.



WASHING UTENSILS.

A, Towels; B, Baths; C, Nail-brush; D, Sponge; E, Bag of blue; F, Lux; G, Glycerine; H, Vinegar; I, Sharpened match-sticks.

The bird is now ready for drying and should be placed in a basket—an exhibition hamper used for show purposes will do—near the fire. The canvas lining to the basket will protect the bird from the fire. Fix a perch inside the basket, and having placed the bird thereon, put the hamper reasonably near the fire. The drying to be a success must be slow, and it is a good plan to make up the fire and retire to bed, waking up in the morning to find the bird dry. Where a lot of birds have been washed some fanciers put a guard on the fire and allow the birds that are drying to roost all night on a clothes-horse fitted round the fire. Before sending a bird to a show see that the hamper is perfectly clean or the bird will be made dirty again and washing will have been in vain.

The above advice applies for the most part to *white* fowls. With dark-plumaged birds washing is not imperative. By drawing a large, slightly damped handkerchief across a dark-plumaged bird most of the surface dirt will be removed and the plumage made glossy. The legs of the exhibit must be scrubbed with soap and water and a nail-brush, and the dirt removed from under the scales by means of a sharpened match-stick or blunt penknife. The legs should then be scrubbed a second time. The legs can be attended to either after the bird is dry or before it is washed; if the former, wrap the bird in a soft towel during the operation. When the legs are dry rub on the slightest particle of vaseline and polish the legs with a flannel. Next wash the face, comb, and wattles, and rub thereon a little vinegar or olive oil to redden up the head properties. White lobes must be carefully dried and zinc ointment applied to prevent blistering.

II. The Utilitarian.

It is naturally to the Utilitarian that the United Kingdom must look for her egg and poultry supply if she is to produce all the eggs and poultry demanded by the buying public. A later chapter will be devoted to the utility poultry-farmer, but I append a few words concerning the backyard utility poultry-keeper.

The Backyard Utilitarian.—Where the hens are properly cared for and are up to standard requirements, backyard poultry-keeping is seldom a failure. It is surprising into what branches of Poultry Husbandry the backyarder makes inroads, all depending upon circumstances, capital, and the space at his disposal. As I have previously mentioned, many of the finest exhibition birds are hatched and raised in a backyard run. There are many suburbanites making a nice round sum profit by keeping a pen of exhibition birds and selling eggs for sitting, advertising their wares in local and other papers, and so working up a connection. One man I know turns over £7 profit a week by running a number of incubators in his back-garden and selling day-old chicks and ducklings. Other backyarders keep up to 50 fowls and make a nice profit from selling new-laid eggs for table purposes. So long as he keeps his fowls dry and comfortable, feeds them regularly and correctly, and keeps their surroundings clean, the backyarder will always have full egg-baskets. In the winter the hens want more care than in the summer, and what is more, they *must have it*. Strict accounts should always be kept.

Over-feeding must be avoided at every turn, and the birds must have plenty of exercise and green food. No one is better placed for profitable poultry-keeping than the backyarder, who has at his command free of charge house-scraps, etc., and who can keep all his birds under his eye. Good birds must be purchased, preferably big, well-matured pullets to start with. If the start is made in September the house and run can be built and the pullets purchased and got into winter quarters ready for laying by October. It is penny wise and pound foolish to begrudge an extra few shillings spent on foundation stock. Is it not ridiculous to suppose that a pullet of nine months old can be purchased "in lay" for 2*s*. 6*d*. ? Yet so many are still of this opinion and wonder why they fail to get full egg-baskets. It is not too much to give 7*s*. 6*d*. or 10*s*. 6*d*. for matured pullets on the point of lay. These birds will always show what they are made of if purchased from a noted utility breeder.

III. Eggs for Sitting Trade.

In selling sittings of eggs the poultry-keeper should make up his mind to give entire satisfaction, for *a satisfied customer is a walking*

and permanent advertisement. The eggs-for-sitting trade is in many cases the mainstay of the poultry-keeper, especially the poultry-farmer, and it will be found that a man who is satisfied will come again for stock birds and eggs the following year, and whip up his friends to do the same. The railway servants are not always over-careful, and breakages are annoying. Try and meet a dissatisfied customer all you can, even to the extent of sending him a full sitting of eggs *free.* You benefit in the long run. Do not take a firm stand against a man who has had one chick from a sitting of eggs and is downhearted; offer him another sitting of eggs at half-price. With regard to the price of sittings, do not ask too much until you have made a name, or you will be disappointed with the trade done. Advertise cleverly and regularly, and do not forget that in addition to the poultry papers there are always the local papers, especially in country places. Advertise your wares and enter into any controversy in the poultry papers that interests you. Occasionally send in letters on the breeds you keep, pointing out their merits, etc. More money can be asked for eggs from Palace-winning birds than "local" winners, and likewise from "Competition" layers than from ordinary hens.

As regards packing the eggs, special egg-boxes to hold a dozen or fifteen eggs may be purchased from appliance firms, and these should be used where the amount received for a sitting allows. There are special boxes that are returnable, the purchaser sending them back to the vendor, and there are cheap cardboard boxes that are commonly used. Suffice it to say that egg-boxes are made in all shapes and sizes, and at various prices, and the poultry-keeper must study his trade. It is the custom to offer to replace unfertile eggs if returned to the vendor within a week. Many, however, offer fifteen eggs (three over the usual dozen) instead of replacing unfertiles. In such cases boxes to hold fifteen eggs must be purchased. It is always as well to keep a stock of egg-boxes handy. It repeatedly happens that a man sends for two dozen—one sitting of one breed and another of another—so that a stock of two-dozen-size egg-boxes must be kept.

Packing the Eggs.—Many poultry-keepers use ordinary boxes of a suitable size from the grocer's, especially where the return from the sitting of eggs is not a lot. Wrap each egg singly in a piece of paper, and having put a layer of sawdust on the bottom of the box, add a little hay and lay the eggs *flat,* placing more hay on top and then bran. It is advisable, perhaps, to pack the corners of the box well with hay. Carefully nail the box down and tie up securely with string. Having labelled the box—

EGGS FOR HATCHING: URGENT, AND WITH GREAT CARE

and addressed the label, it is ready for despatch. Gummed labels

should be used, and the breeder's name and address should figure prominently thereon. *High-class stationery spells business!* It is a common fault for the purchaser to set the eggs directly they arrive instead of allowing them to rest. Written or printed instructions after the following will prove of assistance :—

> It is essential that these Eggs should be Rested FLAT for at least 24 hours before being set. The Germ and Contents will by then have become settled.

It is a good plan to have a rubber stamp bearing the name of the breed and the pen number, also the name of the farm, and that of the owner, so that each egg may be stamped before despatch. Where unfertiles are returned this will enable the breeder to see that only his birds' eggs have been sent back for replacement. Never resent answering questions, and deal with them fully. *Civility costs nothing* and yet it brings in returns.

IV. Eggs for Market.

It is in this branch more than in any other that a "speeding-up" is necessary. New-laid eggs will always fetch good prices, although if marketed more quickly than at present they would yield a better return. Wherever possible local demand should be catered for.

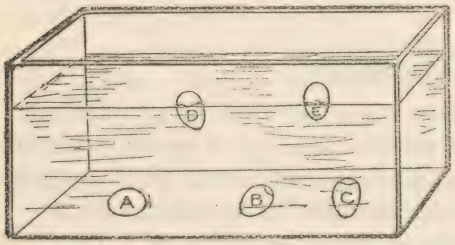
Collecting the Eggs.—Eggs should be collected twice a day and stored in a cool room out of reach of the rays of the sun. A dairy is naturally an ideal store-place. Unfertile eggs are better than fertiles for marketing purposes. The nests and nesting material must be kept scrupulously clean to prevent the eggs from getting dirty. Eggs should be handled by a person wearing gloves, as on every new-laid there is a natural "bloom" when it drops into the nest-box, but it soon disappears if the egg is handled too much or wetted. If it is necessary to remove dirt from an egg try a dry cloth first, and if unsuccessful one slightly damped but not wet. Do not place the eggs by any ill-smelling goods, as new-laids, having porous shells, are very susceptible to smells.

Grading the Eggs.—It is in the grading of eggs that there is so much room for improvement. Dirty, small, badly-shaped and irregularly shelled eggs should be put on one side. The thicker the shell the less the deterioration of the contents through evaporation, so that the fowls must always have a good supply of grit by them. Eggs should be sorted into three grades, and all inferior and small ones should be held back for home consumption. The eggs so graded will naturally be of a uniform size and look attractive when examined by the market salesman. Colour should be studied and brown eggs should be packed

in one box and white eggs in another. It is an eyesore to see eggs of all sizes and three colours in the same box directly the lid is open.

Testing the Eggs.—All eggs should be tested, for this will save endless disappointment. On a farm hens steal their nests and when broodies are here, there and everywhere eggs soon "turn." Anyone handy with tools can fit up an egg-testing table. Medium-sized holes should be made all over the table to receive the eggs and under the table should be fitted a powerful spreading electric light. A table of eggs can be tested in a very short time. An experienced tester can, of course, run through many baskets of eggs very quickly by testing them singly before a strong light. Any eggs where the contents appear dark or clouded should be discarded, as should any containing broken yolks or blood spots. In another chapter will be found several types of egg-testers.

Appended is a sketch showing the housewife's method of testing eggs. Place the eggs in a receptacle containing water. A very fresh egg (A) will lie nearly flat on the bottom of the receptacle, but slight evaporation causes the egg (B) to tip. A badly evaporated egg (C) will stand on end, whereas a very badly evaporated one (D) will float, and an egg still worse (E) will protrude well out of the water. The airspace can be seen in each instance, and it will be noticed that its size increases according to the degree of evaporation.



EGG-TESTING DEVICE.

Marketing the Eggs.—The method of marketing the eggs will depend upon the ability of the poultry-keeper and the number of eggs his hens yield each week. The backyarder need only walk into the front room and display a bill, "New-laids for sale," to sell all the eggs he can spare. Many poultry farmers sell their eggs to the Higglers, but they are the losers thereby. There is nothing like direct trade, the middlemen being missed. The whole method of collecting and despatching as at present adopted sadly wants revising. Eggs must be collected twice a day and marketed three times or more a week. It is the Higgler or collector who tours the counties through for table chickens and eggs who holds up the eggs, preventing them from reaching the breakfast table in the short space of time that they should. They are also held up by other persons through whose hands they pass, and so if the English egg is to take on and oust the foreign egg, all departments must be speeded up and many of the "middle" ones dispensed with.

If the Higgler has to resell the eggs and the latter have to be sold

again and again and yet show a profit on each transaction, it stands to reason that the Higgler cannot pay top prices. By the use of a little common-sense poultry-farmers could put many extra pounds into their pockets each week. We presume that there are several good-sized towns near the farm; the keen business man will possess a pony and trap or a side-car and work up a trade amongst dairies and shops. Private customers, too, will be called upon, and top prices made for both table chickens and eggs. Should the farm be situated facing a main road where motor traffic passes, a well-painted ornamental board bearing some striking wording that eggs and table poultry could be had would, if fixed in a prominent position, bring many motors to a standstill and result in good orders. One should be able to work up an excellent connection thereby, and by giving satisfaction and studying customers turn over a good trade week in and week out. There is always an excellent demand for the "best" eggs for invalids, etc., and persons residing in towns who insist on *genuine* new-laids, and it is possible to obtain their custom by advertising your goods in some of the high-class ladies' and gentlemen's periodicals, local and county papers, etc. Everything depends upon the man at the helm in anything appertaining to poultry.

Packing the Eggs.—Where the eggs are sent direct to the big salesmen large egg-boxes to hold from a long hundred eggs (120) and upwards, with internal sections to take the eggs, are used. These are returnable, and there are scores of designs on the market. Salesmen naturally prefer non-returnable boxes, but the poultry-farmer saves a deal in having the boxes returned and very few use the non-returnables. Eggs easily deteriorate, and as they are so quickly affected by damp or dirty fittings, it is advisable to renew the cardboard sections and dividing sheets frequently. Just before sending the egg-box away slip a sheet of paper therein, advising the vendor of the number and weight of the eggs contained in the box. Never be afraid to give the salesman fullest particulars *re* the consignment, so that he can have the same at his fingers' end.

Standard for Eggs.—I append a standard for judging eggs :—

Freshness	40 points.
Size	15 „
Texture of shell	15 „
Uniformity of size, colour, and shape ..	15 „
Cleanliness and bloom	15 „

Eggs are passed over if they : (1) rattle in shell ; (2) are double-yolked ; (3) contents are tainted in any way ; (4) are artificially coloured, and (5) are polished. In judging the freshness of an egg the following tests are suggested : Size of air-space, density of albumen,

firmness of chalazæ, toughness of yolk membrane, roundness of yolk, and by freedom and completeness with which contents leave shell when broken.

V. The Preservation of Eggs.

The preservation of eggs should be much more popular with poultry-keepers and housewives than what it is. In the summer eggs can be purchased in many country places at 18 to 20 a shilling, and it requires very little reasoning to work out the profit left when these eggs are taken out of the preservative six months later and sold for 1½*d.* each. The housewife, too, can put down these cheap summer eggs and consume them when eggs are twopence each or more in the winter. If the eggs are to be sold it is best to tell the purchasers that they are "preserveds." It is surprising for how long these eggs can be left in the preservative—anything from six to twelve months—and in the end be quite fresh and wholesome.

Eggs and Vessels to Use.—With the various egg-preservatives on the market are given printed instructions as to their use, and these should be strictly adhered to. Select only sound, fresh eggs having smooth, firm shells, and discard any dirty, cracked, stale, or thinly-shelled ones. Eggs that float in the liquid will, of course, be removed, as such will be anything but fresh. It is argued by some that unfertile eggs are better than fertile ones. Metal containers are unsuitable as the preservative will attack and corrode them; use glass, earthenware, or wooden ones. Before use the vessels should be well scalded out with hot water. Many persons merely dip the eggs in the preservative, afterwards storing them on shelves, but it is better to keep the eggs in the preservative and take them out when needed. The containers should be kept in a cool place—temperature from 35 to 45 degrees—and covered over to keep the dirt from falling into the preservative.

The Preserved Egg.—Eggs may be preserved for from six to twelve months, and the best months in which to put them down are from March to June—when they are cheap. Before being sold it is wise to test the eggs by means of an egg-testing lamp; any that show dark spots or shadows inside should be discarded. One can easily tell what a sound egg should look like by holding a "genuine" new-laid up to the light and observing the nature of its contents. With some preservatives it is advisable to pierce the egg-shell with a needle before boiling the egg, to prevent it from bursting. This, however, is not necessary with all preservatives. There is a good opening for egg-preservation on a large scale, in which case large tanks would be necessary.

VI. Day-Old Chicks and Ducklings.

There are many fortunes awaiting those of my readers with capital and space sufficient to engage in the "Day-old chick and duckling" trade. A few years ago when I strongly advocated this branch of Poultry Husbandry very few indeed regarded it as a business. In recent years, however, many poultry-keepers have followed my advice, but there is room for plenty more. In short, the business consists of selling day-old chicks (and ducklings if deemed advisable) direct from the incubator, and even if all readers cannot engage in it on a large scale many can cater for the demand in a small way to good advantage. Before attention was called to the trade in "day-olds" everybody complained that they paid a good price for a sitting of eggs, and owing to a clumsy broody only three chicks (sometimes less) appeared in due course. They had, therefore, wasted a deal of time over that little trio, and when they grew up it was 9 to 1 that the creatures turned out to be cockerels. All they had for their 10*s.* (paid originally for the sitting of eggs), then, were three "crowers" that had to go in the pot. I saw, as others did afterwards, that for 6*s.* or 8*s.* a dozen day-old chickens could be sent anywhere—straight from the incubator—and show a good profit. The buying public took it up, and always will, for any poultry-keeper will pay from 6*s.* to 10*s.* for a dozen really live chickens rather than the same money for a dozen *doubtful* eggs that may yield chicks from six down to one. It is a purely "business" proposition. In these days when broodies are queer customers it is next to impossible to count chickens before they are hatched, no matter how strongly fertilised the eggs may be.

For Backyarder or Farmer.—The backyarder can engage in the business just as well as can the farmer. The latter has the advantage, naturally, in that he has the stock birds near at hand and gets the eggs at cost price. Again, he will be sure of the fertility of the eggs incubated and so will obtain a greater profit. The backyarder can, however, build an incubator house at the bottom of his garden and stock a few incubators, arranging for one or more to hatch out each week. One backyarder I know makes £7 a week profit from the day-old chick trade, and in a subsequent chapter will be found fuller particulars regarding the building of an incubator house suitable for a back garden. This young fellow sells both chicks and ducklings and uses his green-house to accommodate the little creatures till sold. Small heated hovers or brooders with wire runs attached are placed on a bench that goes all round the green-house, and as a rule the chicks are sold under a week old. The temperature of this green-house makes the latter suitable for mushroom culture—a very profitable

side-line. The space underneath the bench is used for the culture of mushrooms, the beds being made in bins having a covering to keep the light out and the temperature up.

Buying the Eggs.—Those who do not keep a large flock of fowls will have to buy the eggs for the incubators. If from fowls on grass range and from a known breeder, fertility will be good. Popular breeds must be selected to suit the demand, and in purchasing the eggs the operator should buy in quantities, and arrange for a regular supply at an agreed monthly price. An agreement should be drawn up between both vendor and purchaser, embodying the agreed price of the eggs and the stipulation that all unfertiles will be replaced *free*. It is wise to have trial sittings from several breeders, and support that one whose eggs show the best percentage of strong chickens. The profit will naturally depend upon the number of chicks hatched from a hundred eggs, so that the operator should not be happy until he has fully mastered the A, B, C of incubator-management. As a side-line the operator can advertise that he is willing to place customers' eggs in his machines at, say, 1*d.* or 1½*d.* per egg.

Disposing of the Chicks.—The prices asked for the chickens will depend upon locality, demand, and quality. Few persons will grumble at 8*d.* per chicken for pure-breds and 6*d.* for cross-bred chicks. The chicks should be sent away when twenty-four hours old, as they are then excellent travellers and do not require food. It is really surprising what long journeys they can be sent in safety. A box 14 by 9 by 9 inches high will be large enough to take a dozen chicks, and one 15 inches square for two dozen chicks. These boxes should be made of light material and have numerous ventilation holes near the top of the sides. Put a little hay in the corners of the box and a little finely cut chaff on the bottom. Tack a piece of flannel to the underside of the lid, allowing it to hang down a trifle in the centre. A label must be attached to the box, and it must bear the address of the sender as well as that of the assignee. Special gummed labels can be printed cheaply. Special notices, too : "This side up," "Valuable day-old chicks," "Urgent delivery," "Handle carefully," etc., can be bought cheaply. Cardboard chicken boxes can be purchased for a few pence each from most appliance firms. Keep an eye on the train service and drop the purchaser a post-card to say when the chicks will arrive at their destination. Tell him to feed the little ones on delivery, and to place any that seem numbed near the fire in blanket ; they will soon recover. The farmer will, of course, send most of his chickens by rail, but the backyarder will find that by advertising in local papers and by means of bills in corn-chandlers' shops he will have plenty of callers for a dozen day-olds. The purchaser, on receiving the chicks, will either place them in a heated brooder or put them at

night under a broody hen. The best plan is to order them just before a hen is due to hatch, and then the little ones can be placed with any she brings off, which will be about the same age.

The Business Man.—The business man will score in this branch of Poultry Husbandry. Any persons who are at home most part of the day—such as chemists, shop-keepers, etc.—will be well advised to try the day-old chick trade. Incubators require very little attention if good machines are being worked, and there is no reason why seven or eight machines should be too many for the small man. The wise man will engage agents all over the town, offering them a commission on orders and bargaining with them to display well-worded striking bill-heads. Corn-chandlers if "rubbed" the right way would place a few dozen chickens in the window and display a bill giving prices of chickens—"Orders taken within." The chicks would have a nice brooder to retire to, and would attract attention from passers-by. Should any one be a traveller by profession he will be able to pick up many good orders. If the chickens are not sold at a day old, they can be kept on and sold at 1*d.* more per head at a week old, and so on. No doubt arrangements could be entered upon with a local farmer to take all chickens not sold, and the cockerels could be fattened up for market. The dates of hatches should be well advertised in local papers. Many schemes will doubtless suggest themselves to my readers should they take up this branch.

Day-old Ducklings.—There is an equal demand for day-old ducklings at certain times of the year. Ducklings are hardy, and ducks' eggs usually hatch out extremely well. The demand for pure Aylesbury ducklings is best, with Aylesbury-Pekin crosses second; these should, therefore, be hatched. Purchase the eggs from a breeder whose ducks have swimming water, and having found a suitable breeder do not change. In the winter ducks' eggs give a lot of trouble through infertility, but if near a stream keep a flock of ducks yourself; you will find them profitable. It is surprising the number of small men—backyarders, too—who buy a dozen day-old ducklings and fatten them up for table. I can honestly recommend this plan to any who are out for profits.

VII. Raising Table Chickens and Ducklings.

The raising of chickens for the table is sadly neglected. Why this should be I do not know, for if managed properly this branch of Poultry Husbandry should mean for the poultry-farmer and Small Holder one of the best harvests of the year. I shall deal fully with this subject in a later chapter. I cannot understand, too, why the raising of

ducklings for the table is not more popular. Ducklings are ready for market at a very early age, and their hardiness is noted, which accounts for the fact that they are easy to rear and manage. Readers will find a special chapter on "Ducks for eggs and table" further on in this volume.

VIII. The General Farmer.

It is to be regretted that the General Farmer is so far behind the times where Poultry Culture is concerned. The day of the "mongrel" fowl has passed, and yet no person has a better liking for mongrels than the General Farmer. He keeps poultry purely because they *look nice about the place.* For some reason or other he has firmly fixed it into his head that *poultry do not pay,* and so he goes about his work utterly regardless of what the poultry stock on his farm ought to be bringing in.

Improvements Needed.—There is, indeed, much room for improvement, and he should be taught by the powers that be that poultry can be made to be profitable and are as valuable to him as any other farm stock. The mongrel must be replaced by high-class pure-breds possessing good laying qualities. The hen-wife must adopt modern methods. Stuffy out-houses as now used for sleeping quarters must be replaced by modern houses. The hens must be provided with shelters during the winter months. Their menu the year through must be on a more scientific basis. The stubbles and the orchards must be given over to the fowls, so that two crops are available—eggs and fruit. Large fields now occupied by large stock—cows, sheep, etc.—must also carry hens, the latter being housed in accommodations to hold 25 to 50 birds. These houses must be on wheels, so that they and their inmates can be removed to fresh quarters periodically. All suitable ponds must be given over to Ducks, and coarse, common (now useless) grass-land set aside for Geese.

There must be full harvests all the year round. The Christmas Turkeys must claim so much land, and there must be popular and suitable breeds kept for table purposes to produce the spring chicken. Hatching must be brought up-to-date, and incubators installed. There must be no late-hatching, and no "stolen" nests. Broodies must not be allowed to waste their valuable time and their owner's money. In short, the General Farmer should follow the advice given throughout this volume. I am not striving to make the General Farmer into a poultry-farmer, for I know too well that he has his hands full with general work. What I complain of is his neglect of poultry, and if he would only employ some one to look after his poultry stock

with as much care as he himself bestows on his cows, then he would be pounds the richer at the end of each year. I agree that the General Farmer is a hard nut to crack where poultry are concerned, but even if it meant the inauguration of National Farms from which parent stock of high-class breeding could be had free of charge by genuine *General Farmers*, I am sure the Nation would benefit. Once the farmer got 120 eggs or more per annum from each of his hens instead of the 50 or 60 eggs as must now be the case, he would soon see his errors of the past, and for the first time in his life catch the "hen-fever," which is hard to shake off, as most of my readers will admit.

IX. Poultry for the Small Holder.

The Small Holder should not neglect the claims of the domestic hen, and I am glad to see so many Small Holders taking a keen interest in Poultry Culture.

Poultry and Fruit.—No two branches of Husbandry go better in hand than poultry and fruit, and Small Holders who are fruit-growers in a small way should stock poultry on the land carrying the trees to ensure a double crop—eggs and fruit. Poultry, too, are bound to improve the crop of fruit, as they clear the insects and manure the ground. Where poultry are kept in an orchard the latter should be wired round if there is a chance of the hens trespassing, and the fowls kept in large houses, each holding from 25 to 50 hens. There are scores of designs on the market, one's taste being the decider. Up to 100 fowls per acre can be safely kept.

Profitable Branches.—The branches of Poultry Culture to be taken up by the Small Holder will depend upon the nature and extent of his land and surroundings. The raising of table chicks and the production of eggs for table are two safe and profitable branches, but there is no reason why he should not run a few pens of high-class birds in the popular breeds—both utility and fancy—and sell sittings of eggs therefrom. The day-old chick trade and the raising of ducklings for table can also be taken up where circumstances permit.

Value of Co-operation.—The value of co-operation—no matter in what business—is well-known, and applies more to the Small Holder than any one else. Where the eggs and poultry produce of a number of Small Holders are marketed direct and in bulk, profits will naturally be greater than where the produce of each individual is marketed singly or handed over to the Higgler, as is so often the case. Personally, I would recommend several Small Holders in each locality to club together, each doing the work in his special line. The

land could be so arranged that there was always a crop ready for the market. An incubator house could be built, and a few incubators installed therein, so that the eggs could be incubated and the day-old chick trade engaged in.

X. Geese, Turkeys, Guinea Fowl and Bantams.

A poultry book would be very incomplete without reference to Geese, Turkeys, Guinea Fowl, and Bantams. All fit in their places where Poultry Husbandry is concerned, and I will deal with each in subsequent chapters.

CHAPTER III

All about the Egg.

How eggs are produced—Periods of hatching—The egg and its sex—The egg and its structure—Egg-shells—Storing eggs for sitting—Incubating special eggs—Causes of small eggs—Causes of unfertile eggs—Marking eggs—White v. brown eggs—Breeding first-crosses—Abnormal eggs—How to test eggs.

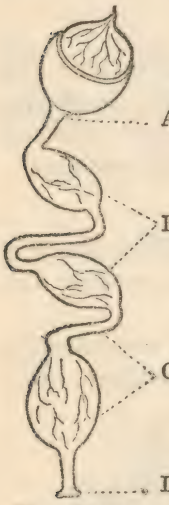
THIS chapter I propose giving over to the "egg." The latter is a *mysterious* little thing, as readers will admit after reading the notes that follow.

How Eggs are produced.—The reproductive system of the domestic hen consists of two chief organs—the ovaries and the oviduct. Our little friend has two ovaries, but only one—on the left side of the body posteriorly—is active. The ovary resembles a bunch of grapes, the ova or eggs varying in size from small spots to that of a good-sized walnut, according to the degree of development.

THE OVARY—Resembling a Bunch of Grapes—Showing the bottom or largest Ovum ready to drop into the Oviduct.

All hens have in their body a number of embryonic ova representing the full number they can develop during their lease of life. The day a chick leaves the shell it is endowed with all the eggs it can ever lay when matured. The tiny yolks or eggs amount to several thousands in even a day-old chick, and as the little pullet matures these yolks begin to ripen. Now it depends upon the skill of the poultry-keeper as to whether these yolks ripen or not. One cannot add eggs to the hen's body whether by breeding, feeding, or housing, but one can make the eggs ripen faster by correct feeding and management for eggs. The *rapidity with which these eggs or yolks develop* depends, therefore, upon feeding and management. The hen requires so much food for her maintenance and growth and an extra supply for the

development of the ova. If she is poorly fed her eggs will not ripen quickly; if she does not get sufficient food she will consume instead of developing the ova within her. Over and beyond the very large number of ova for her to produce Nature gives her a surplus to consume. The wise poultry-keeper will see that she is properly fed so that she is an egg-producer and not an egg-eater (inwardly). By the accumulation of yellow or yolk the ovum reaches maturity, and after being covered by the yolk sac, which is detached from the ovary, the ripe or matured ovum passes into the funnel-shaped opening of the oviduct. The oviduct is a large, whitish-coloured tube, which runs from the ovary to the hen's vent. Each yolk—then a yellow mass—enters the oviduct enclosed in a thin membrane, and is fertilised in the upper part of the oviduct before the albumen is added. The yolk passes down to the vent by means of the muscles of the oviduct walls contracting. A thick layer of albumen is first supplied by the walls of the oviduct, and to each side is attached a thickened chord called the *chalaza*, which keeps the yolk in position and protects it. Then follow two thinner (or more watery) layers of albumen. As the yolk nears the end of the oviduct two more thin layers of albumen are added, forming the inner and outer shell membranes. The air cell—always at the thick end of a normal egg—is caused by evaporation of the fluids of the albumen and the entrance of atmospheric air. The egg finally passes through a special chamber where it is coated with a thin liquid secretion of lime, which hardens quickly and results in the shell of the egg. During the breeding season the oviduct becomes very much enlarged and is covered with a network of fine blood-vessels. An examination of a yolk before any albumen is added will disclose a small circular, whitish body, about one-eighth of an inch in diameter. This always floats uppermost, no matter in what pose the egg may be placed. In a fertilised egg this disk has three distinct areas—an outer white rim, inside which is a clear zone, whilst in the latter is the embryo itself, of a somewhat elongated shape. These three parts are termed the "blastoderm."



THE OVIDUCT.

A ripe Yolk or Ovum is seen just about to enter.

(A) Fertilisation takes place. (B) Albumen added. (C) Shell added. (D) Vent.

Periods of Hatching.—One cannot say for certain just when a chicken or a Bantam will hatch, as so much depends upon the egg itself. The staler the egg the later will the chick make its exit. If, too, the hen should get off the nest during the period of incubation and allow the eggs to get very cold, hatching will be late. That is why one

should not be in a hurry to break any eggs that have not hatched out to time. If the eggs under a hen should get cold, it is wise to dip them in warm water *at once* to bring them back to the normal quickly. Should the poultry-keeper, too, have an accident with his incubator by leaving the egg-drawer out too long, he should act *at once* by turning the lamp wick up higher to get the necessary temperature in the machine quickly. The periods of incubation are roughly :—

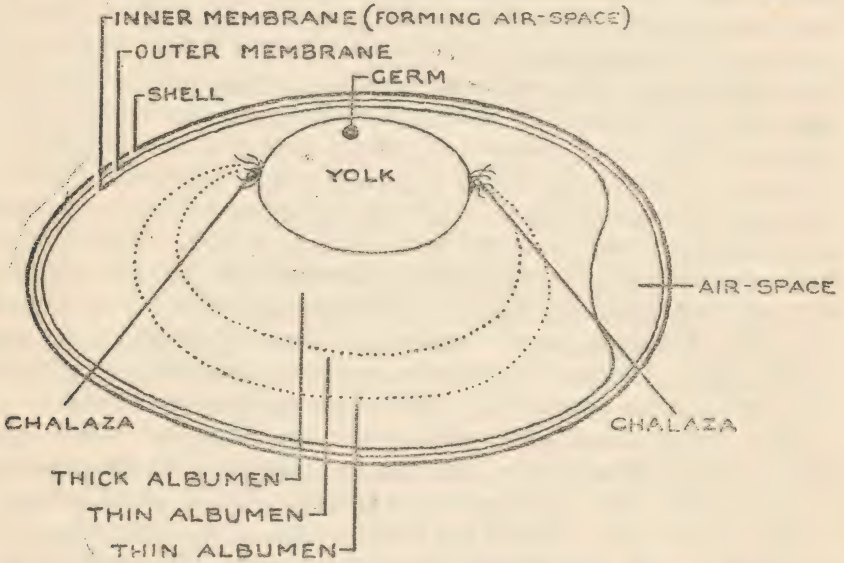
	Days.		Days.		Days.		Days.
Hen	.. 21	Pheasant	.. 24	Guinea Fowl	.. 28	Ostrich	.. 42
Duck	.. 28	Turkey	.. 28	Bantam	19–21	Emu	.. 42
Goose	.. 30	Pea Fowl	.. 28	Swan ..	.. 42		

The Egg and its Sex.—Much as one would like to be able to tell the sex of an egg before the latter was hatched, I do not think this will ever come to pass. It would naturally be very profitable to be able to select a dozen eggs and guarantee all *pullets* to hatch. Sometimes it is just the opposite, and every chicken hatched from a sitting of eggs turns out a "crower." Many years ago a sensation was caused by some one who had "at last" solved the problem. All you had to do was to suspend a needle on a piece of cotton or thread and hold the apparatus over an egg. If the needle swung to and fro a *pullet* could be guaranteed, if round and round a *cockerel*. When put to the test the needle certainly seemed to do the trick, but that was only when the instructions to hold the end of the thread in the hand were followed. When the thread was tied to a deaf and dumb gas-bracket and the egg held under the suspended needle no movement was noticed. There is a fortune awaiting the person who can solve the riddle.

The theory that "long eggs contain cockerels and round ones pullets" is as old as Horace, and can be dismissed. So also can any theory dealing with the air-space of an egg. Nature plays her part in the sex problem. During the early months of the year *males* will predominate, with *females* later on in the season. Those who argue that whichever parent is weaker there will by Nature be less of that sex are near the mark. That is why the parent hens should not be in a fat condition during the breeding season, and why they should not be under-mated. An expert can, however, tell the sex of a chick with a certain amount of accuracy. At a day old the cockerels can be told from the pullets by their large, thick heads, stout, short necks, and thick legs. They invariably hatch out, too, before the pullets —sometimes a day or more before. It is a good plan to ring those chicks that appear before the usual hatching-day and treat them as cockerels. The novice will be better guided by the headpoints, which when the males get older, redden up before those of the pullets. Young males, again, are *often* slow featherers, they having a difficulty to grow their wing feathers. The latest solution is to hold the chick

in the hand, keeping it on its back with its head away from you. Blow gently to part the fluff around the vent, and if the thicker edge or lip of the latter is nearest the head, the chick is a male, and if nearest the tail, a female. My own solution I give last: "Scatter some corn on the grass, and whilst the young stock are feeding steal quietly up to them and gently tap the youngsters on the back. Those that squeal like a boy being spanked are males, and those that merely chirp 'Pretty Dick,' or utter a more kindly note, are females."

The Egg and its Structure.—To the person who asks for the salt and starts to devour his breakfast egg, the latter is just an egg. To any one going deeper into the subject, the little egg is a bundle of mystery. Starting from the outside we have the shell, inside which



are the two membranes or skins—outer and inner. The second or inner membrane forms the outline to the air-space or air-cell. Reference to "How Eggs are produced," in this chapter, will enable the reader to follow the sketch appended. Then we come to the two layers of thin albumen, and next the layer of thick albumen. The latter runs into the chord-like chalaza on each side of the egg. These chalazæ are sometimes mistaken for the germ when an egg is broken, but this is not so, for they only act as "buffers" to protect the delicate yolk which swings to and fro between these supports. The germ (blastoderm) is in the yolk near the top, and a little to the left of the centre. This spot always floats uppermost. Any reader wishing to know his A, B, C of "eggs" should carefully break several into a shallow saucer and examine the contents. The latter must be gently

released from the shell without being mixed. Another interesting experiment is to hold an egg on its side, cut a respectable hole in the top of the shell, and watch the movements of the yolk, etc., from within the shell.

Egg-shells.—Unless an egg is well coated with lime it is useless for hatching. If, too, the shell is thin, the egg will not prove satisfactory from a market point of view, since the thinner the shell the greater the evaporation inside the shell owing to the air being able to penetrate so easily through the thin, porous shell. Keep a regular supply of oyster-shell always before the fowls. A shallow box nailed up inside the house or run will do as the receptacle for grit and shell; it should be about a foot or so off the ground. In the winter the grit in the receptacle is apt to get frozen, so that the fowls are unable to get a supply. Stir the grit up regularly in frosty weather. Bad feeding—the giving of too much soft food, especially—is more often than not the cause of soft-shelled eggs.

Storing Eggs for Sitting.—The average weight of a "standard" egg may be put at 2 ozs., although, of course, hens will lay larger ones weighing 4, 5, and 6 ozs. periodically, upon which I shall comment under "Abnormal Eggs." No egg should be incubated unless it is perfect in shape, of good size, and sound, thick and smooth in shell. Eggs with crinkly shells must be discarded, as also those of abnormal size. Eggs intended for sitting purposes must be handled with care and stored in a fairly cool room or cellar. The small man can store his eggs in any odd room where the temperature is suitable, according to the season. The poultry-farmer will store his eggs in cabinets if he requires them for incubation himself, or for disposal to customers as sittings of eggs. The cabinet should contain long drawers made in narrow sections, so that they can be divided to take the eggs from the various pens. One set of drawers can be reserved for the first pens, another for the seconds, another for the thirds, and so on. Each set must be carefully labelled, as must each division; for it would mean disappointment if a customer got Minorca eggs instead of Black Leghorns', as sent for. Each egg as collected must be marked with the pen number and initials of breed, so that it can be placed in its proper division until required for use or for despatch to a customer. Eggs for sitting should be laid on their sides (not ends)—the only natural pose for an egg—sawdust being used as a bottom layer to the drawer.

It sometimes happens that the poultry-keeper finds it necessary to store his eggs. They can be kept for several weeks if turned each day to prevent the contents of the egg from sticking to the shell. I am not a believer in stale eggs, and recommend readers to try and use those not over three days' old for incubation. The fresher the eggs, the better the results! That is why I advise readers to run a

machine with 60 eggs in rather than keep that number, already stale perhaps, until the full 100 are ready.

Incubating Special Eggs.—It often happens that the poultry-keeper wishes to keep certain eggs separated from the rest. Many use thin muslin bags for the purpose, whilst others section the special eggs off with wire netting. Some precaution should be taken, as it is unwise to trust to one's judgment. Once the special chicks hatch off they should be "toe-punched" or "rung."

Causes of Small Eggs.—Small eggs may be due to many causes, but in nine cases out of ten the poultry-keeper is to blame. Pullets that are allowed to lay before they are fully matured will always lay small eggs. The owner who does not give his hens sufficient water to drink will be treated to plenty of small eggs, as the egg is composed of so much water—over a half. See to the feeding, and give plenty of greenstuff to fowls in confinement. Remember that if you over-feed you will get *small* eggs from your *over-fat* hens. Fowls have the habit of laying on internal fat without the fact being noticed outwardly; this fat lines the sides of the oviduct, and pressing this in causes small eggs. Select good-sized eggs for hatching, line-breed from hens or pullets that lay large "standard" eggs, and make sure of this important point at every turn. Make a note of all hens that lay good-sized eggs, for twenty large eggs may be equal to forty small eggs. Breed for an increased number of eggs, but keep the size of the egg in mind at all times.

Marking Eggs.—The marking of the eggs should always be attended to by a responsible person. Each egg should be marked—using indelible pencil—when collected from the nest. Do not go by chance-work, but do the marking *on the spot*, before the egg is placed in the collecting bucket or basket. The initials of the breed and the pen number should be written on each egg, also the date: B.M. I. 16 equals *Breed* Black Minorca; *Pen* No. 1.; *Date*, March 16. If some code is desired for the pen numbers, X can represent Pen 1, Y Pen 2, and Z Pen 3, or the letters L.M.N. can be used. Collect the eggs regularly—twice a day or more—as in the summer one has to guard against broodies and in the winter against frosty weather. Take the eggs direct to the egg room (after they have been entered up on the record-sheet attached to the inside of the door of each sleeping-house), and there enter up the total of the collection. Then place the eggs in the cabinet in their proper divisions—according to breed and pen. Every poultry-farmer should have a rubber stamp bearing his name and that of the farm with full address. This will enable him to see that only his own hens' eggs are returned as unfertiles. Again, if the eggs are for marketing purposes, this will prove a good advertisement. If I had my own way I would make it compulsory for all

eggs to be stamped with the name and address of the producer, and the date of laying. There would be more "new-laids" in the shops then than there are now. Again, I would see that all "foreign" eggs carried the name of the country of their origin, and that "preserveds" had some similar distinguishing mark. This would prevent such eggs from rolling out of their own baskets into that labelled "New-laids." The question of marketing eggs for the table, however, is a very large one, and I should want a book of the thickness of this one to deal with the subject fully. My advice to utility men is, "Don't be afraid to label your goods—whether eggs or table chickens. Supply goods up to quality and the publicity obtained will bring additional returns." Dainty little labels bearing the name of owner and address of farm should be attached to all market chickens supplied.

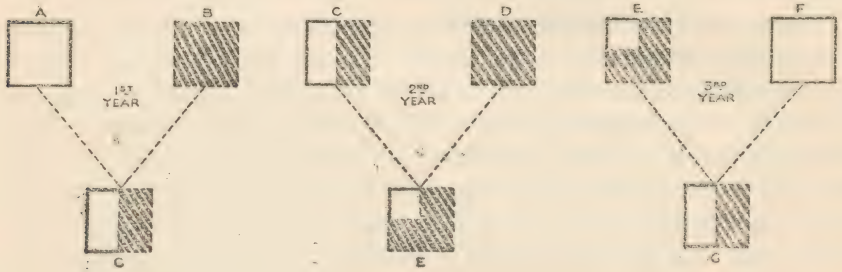
Causes of Unfertile Eggs.—Where unfertiles give trouble it is usually the owner himself who is to blame. If the stock birds are rightly managed and fed unfertile eggs and dead-in-shell should not be common. Breeding birds require a little different feeding to ordinary layers, although this is not always made a point of. On no account over-feed or force-feed breeding stock if you want big burly chicks. The use of weak, immature, or aged parents, careless mating, the over-use of stimulants for breeding stock, unsuitable food, management, or environment are all causes of infertility in eggs.

White *v.* Brown Eggs.—It is the rule that "light" varieties or non-sitters lay white eggs and "heavy" breeds or sitters brown ones, but of course there are hens that are exceptions. There are many strains of White Leghorns, for instance, with broodiness running through their veins. There is no difference from an edible point of view between white- and brown-shelled eggs, although the public run riot on the latter, and even pay higher prices for them than for white-shelled eggs. Whilst this fad lasts it must be catered for naturally. An egg-shell soon changes its colour, and by dipping a white-shelled egg in coffee or in water slightly coloured with a few flakes of permanganate of potash a brown-coloured shell results.

Breeding First-Crosses.—The crossing of one pure breed with another has its advantages, so long as the first cross is kept to. It is the "mongrel" hen that we must not tolerate. Where a white-egg variety is mated to a brown-egg breed the progeny lay tinted or brownish eggs. The advantages of such crossing of non-sitter and sitter lie in the fact that the progeny will lay more eggs and yield fuller winter egg-baskets than the original parents if the latter are well selected. It is advisable to rely on the hen to preserve the tinted characteristics of the egg, so that in any such crossing hens of the brown-egg breeds should be mated to males of the white-egg varieties.

The following first-crosses between non-sitters and sitters are good: Black Leghorn—Croad Langshan, Black Minorca—Croad Langshan, Ancona—Croad Langshan, Ancona—Buff Orpington, White Leghorn —White Wyandotte, White Leghorn—Light Sussex, Buff Leghorn —Buff Orpington, etc.

The accompanying sketches will explain the method of breeding first-crosses. We start with a White Leghorn cockerel mated to White Wyandotte hens, and the main idea is to use a White Leghorn cockerel one year, a White Wyandotte male the second, a White Leghorn male the third, and a White Wyandotte cockerel the fourth. The first year we mate A (White Leghorn cockerel) to B (White Wyandotte hens) and produce C. In C we have *first-cross* pullets and cockerels, each having half the blood of the mother and half the



blood of the father. The second year we mate the first-cross pullets (C) to a White Wyandotte cockerel, and the result, E, is cockerels and pullets having three-quarter blood. Now, by mating in the third year E pullets, which are three-quarter blood, to F—a White Leghorn cockerel—we get G, which are practically half-blooded stock or first-crosses.

Abnormal Eggs.—There is no limit to abnormalities in eggs. I will touch briefly on a few of them.

Blood clots in eggs are troublesome. They are usually caused by the rupture of the blood-vessel in the ovary at the time that the ripe ovum drops into the oviduct. This trouble is very common with pullets when they commence to lay owing to the strain placed upon the laying organs. A blood clot can easily be seen if the egg is tested in front of a strong light. The red clot will be noticed to float on the top of the yolk. A hen will sometimes lay what is termed a " bloody " egg, the albumen being discoloured. Such eggs should be discarded for marketing purposes and the layers should receive a strengthening medicine, which should be the case with all egg-abnormalities. Some hens have a tendency to produce these eggs, in which cases it may be wise to kill the birds.

Meat spots.—Unlike blood clots which float with the yolk, meat spots are found in the albumen and appear to be pieces of the dead glands of the oviduct. The spots, too, are not so red as the blood clots. If the spots or clots are removed the egg can be eaten, but it is wise not to market such eggs, as the ordinary consumer tries to imagine all manner of things owing to the fact that he is not a "chicken" man.

Soft-shelled eggs.—These are caused by over-feeding or by a poor supply of lime. They are also due to other eggs forcing them out of the oviduct before they are coated with lime.

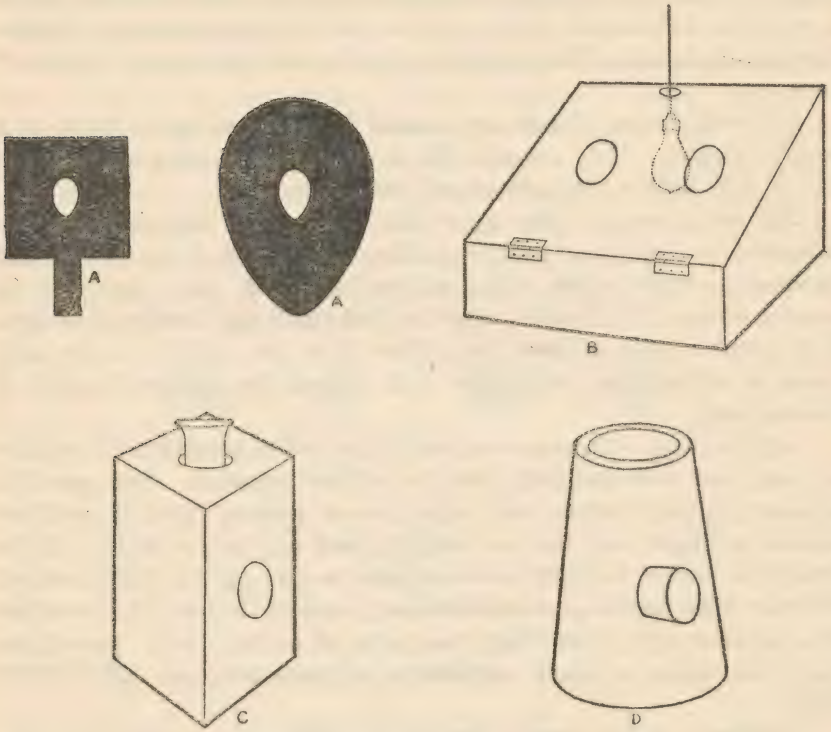
Egg within an egg.—An egg within an egg often turns up, and this is caused by an egg or yolk ascending the oviduct it has just passed down and intermingling with another egg, yolk, etc., that may be coming down. This is the reason we find small eggs inside other eggs. It is possible for a yolk to drop before it is ripe, and it is some such cause or other that makes the yolk ascend the oviduct instead of passing out.

Double-yolks.—These are caused by two yolks being joined together in some way and dropping into the oviduct together. One secretion of albumen may enclose two yolks that are passing down the oviduct almost together, and then a double-yolked egg is the result. If the two yolks are too far apart to be enclosed as one egg a small amount of albumen with membranes and shell may connect the two eggs, resulting in a peculiar egg, resembling the shape of a dumb-bell. Sometimes only the skins or shell membranes connect the two fully-shelled eggs.

Mustiness.—If an egg is kept for a long time in a too humid atmosphere it develops a musty smell and flavour. It is due to an excess of moisture for a lengthened time. *Mould spots* are caused in the same way.

How to Test Eggs.—The testing of eggs, whether for fertility or the quality of their contents, is very essential. By testing for fertility one is able to give broody hens their full complement of fertile, and so hatchable eggs, and what is more, the eggs that are left are all the better for the removal of addled or bad eggs. An expert tester can put an egg in his hand, and holding it up to the sun say whether it is fertile or not. The same person would be able to test an egg satisfactorily after it had been incubating only three days. The novice will, however, be content to test his eggs on the seventh or even tenth day and make a second test for fertility on the fourteenth. The earlier the test the better, for then any unfertiles can be removed from under the hen or from the incubator and fertile ones added. That is why it is advisable to start several broodies off at the same time, so that when testing comes round two of the broodies can take the fertiles

and the third have a fresh sitting entrusted to her. Incubators can be treated in the same way if several machines are started at the same time. I give here a few sketches of suitable egg-testers :—



To make A procure a piece of stiff cardboard cut to any shape and with a sharp knife cut therein an oblique hole almost the size of an egg. To test an egg hold the cardboard tester close to a strong lamp and hold the egg up to the opening in the cardboard. Fig. B shows a novel egg-testing box. An electric bulb in the box gives a bright light and the eggs to be tested (two at a time) must be held to the holes in the lid of the box. C is an ordinary box and contains a small lamp, the chimney-piece to which may be seen protruding from a hole in the top of the box. Fig. D shows a useful appliance that can be fitted over any ordinary small hand-lamp.

In egg-testing the main thing is to use a very powerful light. A powerful acetylene lamp is ideal, and many place this in an ordinary cardboard box, making an aperture in one end through which the light may shine. Let the novice first examine a new-laid egg and he will then know what an unfertile looks like when held up to the light. Discard all clear eggs that seem transparent. The most noticeable

feature of a fertile egg is the very clear and distinct line separating the air-space from the rest of the contents of an egg. In a fertile egg a small spot will be seen—the live embryo—and going in all directions therefrom will be seen veins, the whole resembling a spider in a web. If an egg contains a dark mass that moves to and fro, and the spider-like form is absent and the air-cell line *misty*, the egg may be removed as containing a dead germ. These "dead" or addled eggs give off poisonous gases, and such must prove harmful to other eggs containing live germs if they are not removed as early as possible. Any doubtful eggs should be marked and left for the second testing. Do not prolong the testing to spoil the eggs. At first the process may seem slow and difficult, but once mastered it will be quite easy and full of interest and instruction.

CHAPTER IV

Hatching: Natural and Artificial.

THAT hatching is an exact art few can deny. Whether with incubators or hens, the operator must start with eggs that are *hatchable* or he cannot hope to meet with success. Then he must select suitable hatchers and manage them correctly. Thus the parent stock must be properly mated and fed if they are to lay eggs that will hatch satisfactorily. Far too many poultry-keepers regard too lightly the whole question of hatching. They remain loyal to old methods instead of branching out on new lines by way of an experiment. The operator nowadays must regard every egg that does not hatch as so much lost and should not be content till he has increased the hatching percentage to well above the average.

Natural Hatching.

Natural v. *Artificial hatching—Broodies to select—Reasons for failures—Hatching boxes—Preparing the nest—Setting the hen—Hatchable eggs—Management of broodies—Tethering broody hens—Value of egg-testing—Hatching time.*

Before dealing with natural hatching I must say a little about that old controversy that is always with us, viz. "Natural *versus* Artificial incubation." Many there are who still swear by the hen and will have nothing to do with the incubator, maintaining that naturally-hatched are stronger and better than incubator-hatched chicks. It is time this argument was dropped, for we could not do without the incubator. How would the poultry-farmer who raises several thousand chicks a year get along if he had to rely solely on hens? On the other hand, for the small man the broody hen must naturally have the advantage over the incubator. The man who hatches artificially complains that he has a larger percentage of dead-in-shell than where hens are used, but this trouble is due, I am sure, largely to the parent stock and operator himself. Those who have still a warm spot in their hearts for the hen should combine natural with artificial incubation. The vital period of an egg undergoing incubation

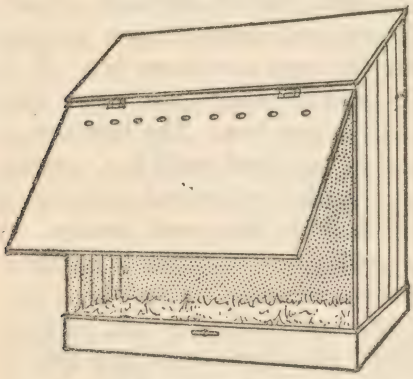
is undoubtedly from the third to the eighth or ninth day, and a plan that is worth attention is for the eggs to be set under hens for the first ten days and then transferred to the incubator to be finished off. Thus during the twenty-one days a hen can be entrusted with two lots of eggs and take a full batch of chickens, when hatched, direct from the incubator. If necessary three lots of eggs can be allowed each hen if she seems steady at the end of the twentieth day and looks fit enough to sit for another ten days. It would, of course, be necessary for a goodly number of broodies to be set at the same time and for the unfertiles to be removed and replaced by *fertiles* to make sure of each hen having her full batch of hatchable eggs.

Broodies to select.—When a hen desires to sit a fever comes over her and her blood becomes heated. When the broodiness has got a hold—after a few days—the hen appears to be all of a tremble and plucks the feathers from her breast—Nature's way of providing greater warmth for the eggs, I suppose. Success will depend upon whether the hen is really broody at the time the eggs are given her. It is useless to hurry things and chance to luck; always make sure that the fever has got a firm grip before setting any hen. The best test of a hen's broodiness and reliability is to place one hand under her, opening out the fingers in doing so. If she shuffles her wings and endeavours to brood the tips of your fingers she is likely to be a good broody. A clumsy hen that has the tread of an elephant or one that is excitable and always on and off the nest is more than useless. Select hens that possess an abundance of fluff on thighs and under the tail, as their clothing will keep the eggs warm. Never set a hen that is in a thin or poor condition, for the chances are she will die on the nest. Avoid broodies with scaly legs, as this trouble will only be handed over to the chicks. Feather-legged broodies should have the feathers on their legs cut off, as these prove an hindrance, and eggs are apt to get pulled out of the nest by reason of the leg-feathers catching under them. There are broodies and broodies, as every poultry-keeper finds out sooner or later. All are not like one of my friend's Buff Orpington hens that sat tight on the top of a barrow of potatoes whilst he wheeled his cargo from his allotments through the town to his backyard, and passed the hen from the potatoes to a dozen eggs without a grumble from the Biddy.

Reasons for Failures.—There are many reasons to account for failures in natural hatching. The commonest is that the hen is given the eggs before she is properly broody. Allow the hen to sit on a few dummy eggs before giving her the sitting she is to be trusted with. A hen may forsake her nest owing to the attacks of insects; dust both hen and nest with insect powder before setting the hen. Other reasons are through the poultry-keeper setting the hen too near the

other fowls, and she becomes anxious to get back to them, or through giving the broody too many eggs to cover, or allowing her too long off the eggs at feeding time. If too many eggs are placed under a hen a different egg finds itself out in the cold each day—owing to the broody shifting the eggs when following Nature by turning them—and the chick in each *chilled* egg perishes. By the end of the hatch every egg has been chilled and no chicks appear. A broody hen, believe me, is a gold-mine, and that is why every poultry-farmer should keep a stock of reliable broodies on the farm no matter what their ages may be. Mark every hen that turns out a good broody and mother, and keep a few of the selected ones in harness. They will repay in the number of chicks they hatch out and successfully rear.

Hatching Boxes.—Many poultry-keepers set their hens on the floor in out-houses, etc., but there are disadvantages here, for the hens are free agents and can either come off at leisure or sit tight—two extremes to be avoided. There is nothing like having the broodies under one's own control. Where a hen is allowed to come off at leisure she may have a fright at night and leave her nest, not being able to find her way back till morning. You may find her snugly set on the eggs in the morning, but the little incident that happened in the night has spoiled the eggs, as you find out when the hatching time is up and no chicks arrive. "Well," you say, "I cannot make it out, for I never saw such a sitter; every morning I peeped at her she was sitting so nicely. The eggs must have been rotten. I shall . . . etc., etc." These nightly episodes would explain everything in the case of many bad hatches did they not go unnoticed.

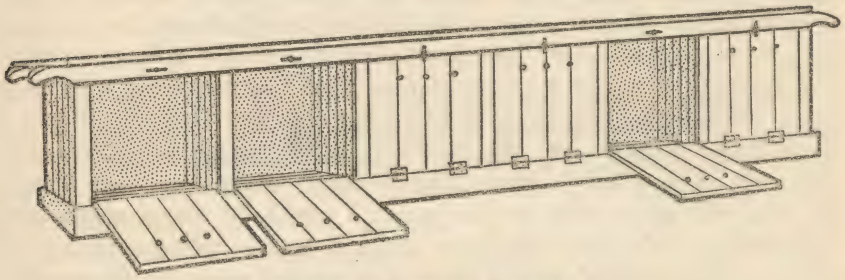


HATCHING BOX.

For the above-mentioned reason I prefer to have my broodies under lock and key, as it were, taking them off to feed every morning and putting them back on the eggs when *I* and not *they* think the time is up. An ordinary sugar-box eighteen inches square and eighteen inches (or more) high will make a serviceable sitting box. Turn the box on its side after removing the lid and use the latter for the front after making the necessary alterations. Fasten a strip of wood some four or five inches deep across the front of the box to keep the nesting material in and fit the door on hinges at the top. Bore—using brace and bit or red-hot poker—a number of holes at the top of the door for

ventilation purposes. A few similar holes may be bored in the back of the box at the top. The box is now ready for the nest, eggs, and broody. Many poultry-keepers use orange-boxes, and these will prove very useful sitting boxes where several hens are to be set. Keep the broodies under your control by placing a long wide plank along the top of the orange-box and a few heavy bricks thereon to keep it in position.

On the poultry farm, where scores of broodies are set, ranges of sitting boxes will be found useful. A range of six hatching boxes can be purchased very cheaply. Not a few build a long range of boxes—as many as fifty or more—and cover the whole with a continuous Λ-shaped roof to protect them from the rain. The complete range, too, is kept a few feet off the ground—thus being protected from vermin—by supports. Gamekeepers make use of such ranges of sitting



RANGE OF SITTING BOXES.

boxes, one range facing another with a grass walk between. Each morning the hens are taken from their nests and tethered up whilst feeding. By keeping the broody hens together like this less time is taken up in attending to them and less ground space used. A friend of mine has turned a long range of disused rabbit-hutches into a set of sitting boxes, each box having a small run for the broody to use.

Preparing the Nest.—Better results will accrue where the nest is made on *terra firma*, but this is not always possible. Some poultry-keepers use bottomless coops to obtain their object. To prevent rats or mice from working their way underneath the sitting-box a piece of perforated zinc can be nailed over the bottom. First obtain some nice soft soil and put it carefully through a sieve to remove any stones that might protrude and break the eggs. Put the sifted soil in the box, well beating it down with the flat hand. Pay careful attention to the corners, as these should be tightly packed. Next scoop out a little of the soil in the centre, but be careful not to make the hole too deep. The only natural pose for an egg is flat on its side or nearly so, and better results will be achieved where shallow nests are made than in deep ones. Having completed the hollow, pack plenty of hay into

the corners of the box and round the sides and add a sprinkling—not too much—in the hollow. Where straw is used soften it by rubbing it in your hands. Hay should be used in preference to straw. Sprinkle a little insect powder on the nesting material and place the eggs in the nest ready for the broody.

Setting the Broody.—As I have previously stated, there are broodies and broodies, and the poultry-keeper must use his common sense in managing those he is dealing with. One hen will consent to be placed on eggs in a dog kennel, whereas another will not sit except in the old nest box she knows so well. The poultry-keeper must be patient and humour any broodies that give trouble. A person who has made pets of his birds will find them ideal broodies, but he may have to deal with a strange hen he has loaned or purchased and then it is a battle of *patience* v. *hen-awkwardness*. Broodies should be set at night by candle-light, as by night fowls appear stupid and will consent to be handled. Before seeing the eggs the broody should have a good feed of maize and be well dusted with insect powder—the latter operation taking place over a newspaper, so that the powder can be used again. When the hen is ready show her the nest of eggs and see if she will walk straight on. Do not move quickly to frighten her in any way, but humour her in every possible way; if you lose your temper the hen will never take to the eggs. I could fill many pages with descriptions of the broodies I have met and how I overcame their little tempers, but my readers will meet with similar cases for themselves. One hen may show a dislike to the lamp, in which case shade the light with the hand. If the hen consents to be handled, gently guide her on to the eggs if she appears at all clumsy. Allow her a few minutes to settle down, and then retire, leaving her for the night. Write in blue pencil on the sitting box the date the eggs were put down and the date the chicks should be due. Never trust to guess-work. Select quiet spots for the sitting boxes, away from other fowls if possible.

Hatchable Eggs.—In the first place an egg that does not possess a firm shell should be avoided. A soft-shelled egg is easily crushed when coming in contact with other eggs; again, a chicken must naturally find it very difficult to extricate itself from a shell that crumbles. Occasionally it happens that the broody will put her toe-nail through an egg, in which case a piece of stamp-paper will put things right if it is fastened over the aperture. Hatchable eggs are only possible from healthy, well-fed, and properly-mated parent stock. *All travelled eggs should be rested for twenty-four hours or so before being set, and all packages of eggs should be opened and examined before the railway delivery sheet is signed.* If four are broken sign for those unbroken (stating the number), and send in a claim for the value of those broken.

Where the eggs have been purchased on the understanding that unfertiles will be replaced take care not to break or destroy them. Take them out at the time of the first test and return them to the vendor. The latter is quite within his right to refuse to replace unfertiles if the eggs are not returned to him. Where scratching sheds or shelters are provided to each house or run fertility will be increased.

Management of Broodies.—It is wise not to disturb the broody the day after she has been set, as this gives the eggs a good start. The next morning open the door to the sitting box, and if she comes off of her own free will so much the better. If it is found necessary to take the hen off, be gentle, but firm. Catch hold of the bird by the thighs —one in each hand—taking an outstretched wing on the point of each of them. See that no egg catches in her fluff or leg. Next shut up the box so that she cannot see the eggs. This will prevent her from being excited and anxious to get back. Give her a feed of maize, which is the only food necessary whilst she is sitting. Maize is an excellent heat-producing grain and will keep up the hen's body-heat. Do not give the hen soft food of any description, for her droppings must be kept firm. Provide her with a dust-bath and a basin of clean drinking-water. Should she make the eggs and nest dirty remove the nesting-material and add fresh and wash the dirty eggs with *warm* water. Some hens die on the nest, but this is due either to their being in poor condition or to their sitting so tightly without getting off to feed and exercise themselves. Both can be remedied! Should a hen suffer from diarrhœa give feeds of boiled rice dusted with pulverised chalk.

As regards the time when a hen should be off her eggs, this will depend upon the weather and the number of days the eggs have been incubating. During the first week—a critical period—it is not wise to allow the hen off for more than ten minutes. Later on fifteen or twenty minutes—in favourable weather—would not be too long. It is a good plan to keep a piece of thick flannel handy, and in cold weather the eggs can be covered over with this whilst the hen is off. The best test is by the feel of the eggs; so long as they are warm to the touch all is well. Personally, I like to see the hen do her business and next have a good feed, for I know then that she will not be fidgety and want to get off again, as is often the case when she does not do her duty.

Tethering Broody Hens.—Where broody hens are confined and have only a small earthen enclosure to run in when off the nest, tethering is not necessary, for they can easily be caught and put back (or enticed to go back) on to the eggs. Where the hens have open range, as on the farm, they must be tethered, as the eggs would spoil if it so happened that the hen escaped and had to be chased. The hens can be tethered

up to a hook in the ground or a post, the other end of the cord or tether being loosely tied (slip-knot) to one of the broody's legs. This tether should not be long enough to allow two hens to reach one another and fight, but should allow each hen to get at her drinking-water, food, and dust-bath of ashes.

Value of Egg-testing.—The value of testing eggs for unfertiles cannot be over-estimated. It is unwise to allow addled eggs to be in the nest with others containing live germs, as the former give off poisonous gases. The eggs, as mentioned in another chapter, should be tested on the seventh and fourteenth days, unfertiles or bad eggs being removed. Several hens should be set on the same day, so that each can have a full number of *fertile* eggs, and each left with none can be given another sitting.

Hatching Time.—Go canny when hatching time comes round, and do not disturb the broody unduly. The chicks will not be due till the twenty-first day, although some may pop out on the twentieth day. On the nineteenth and twentieth days, especially if the weather is warm and dry, sprinkle the nest and eggs with warm water just before the hen goes back to the nest. When she sits on the eggs her body-heat will moisten the eggs, and so soften the inner skin or membrane of the egg and give the chick a better chance to break out. If this is not done the membrane inside the shell dries and very much resembles tough parchment. Those chicks that hatch early are usually cockerels and can be marked if desired. Do not take the hen off to feed after the twentieth day, but offer her a drink of water as she sits on the nest. Never *feed* a sitting hen whilst she is on the nest. When it is known—by the chirping—that several chicks are off, gently remove any egg-shells (although some hens will do this), and take the chicks indoors, as this will give the hen a better chance to give her full attention to the other eggs. I am, of course, giving general hints, so that the reader must sort them out according to his circumstances.

If on the twenty-second day there are still some eggs, place them in a basin of warm water and any that bob up and down will be known to contain live chicks. Leave these with the hen another six hours and examine them again to see if there are any further developments. It is best to let the hen call the chicks out, but if any egg seems to hang fire on the twenty-second day take it gently between the thumb and first finger of the left hand and give the top (large end) a sharp tap with a blunt knife, hitting part of the thumb at the same time so that the egg will not be smashed. Now carefully peel off the shell, taking care not to make the chick bleed. This operation is best performed near the fire, and directly the chick has been liberated place it in flannel in a straw or bowler hat near the fire or in a medium-heated oven. It will soon be chirping merrily.

Personally, I do not recommend helping out any chicks, but give the method usually adopted. Where all or the majority of the chicks are not out by the twenty-second day, it may be unwise to touch the eggs, except just to damp them. Where the hen has been off the eggs too long at any feeding time, or the eggs were stale when set, this late-hatching is quite common. Kill all cripples and weaklings, as these never pay to rear. If a weakling is allowed to go unnoticed he or she may turn up later in the breeding pen and then the progeny bred will be inferior. Again, such a chick may live till three months old and suddenly depart—the owner picking it up one morning in the run dead—leaving behind its bill of feeding.

Artificial Hatching.

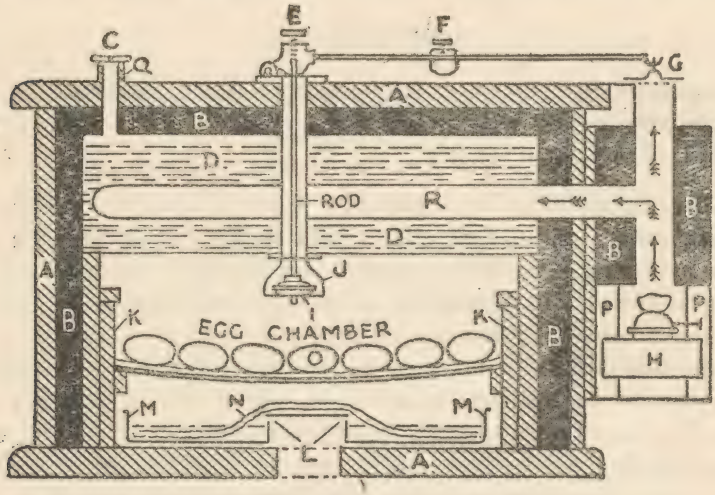
Choosing an incubator—Hot-air machines—Hot-water machines—On temperatures—Turning and cooling the eggs—Incubator charts—Dead-in-shell—Between the hatches.

Had I the space at my command, I would give the evolution of the incubator, and readers would find it interesting reading. Unfortunately, space forbids. Ancient authorities recommended the placing of eggs to be incubated in the manure heap, which brought about the French cask incubators, which were partly sunk in manure. Recesses over bakers' ovens were in the early days used as incubators. History has it that a lady hatched an egg in her bosom, and Pliny relates how the Empress Livia might have hatched a chicken in her bosom had she had the patience to keep an egg there for twenty-one days. Over a century ago the Egyptians hatched out chickens in mammoth egg-ovens that held 40,000 to 80,000 eggs, the management of these " wonders " being held a secret amongst the clever Bermêans. The operator took as his payment a percentage of the chicks hatched out. Mud incubator-huts are still in use in Egypt, each holding about 5000 eggs. The latter are placed on the floor on pieces of wood placed cross-ways in the nature of a grill. The operator places in the hut sufficient food and water to last him three weeks, and having entered the hut the door is sealed up. The operator's duty is to move gently over the eggs, his body-heat eventually hatching them. Well may we be thankful for the modern incubator !

Even in these days we read of novel methods of artificial hatching. The Chinese rice-tub incubator takes some beating, yet it is widely used in certain parts of China. The operator takes a quantity of unhusked rice, roasts it, and then cools it till it is luke-warm. He next spreads a three-inch layer of rice in a wooden tub and puts about 100 eggs thereon. This is repeated until the tub contains 500 eggs—

six layers of rice and five of eggs. The rice is heated once every twenty-four hours, the eggs being taken out for that purpose and afterwards replaced, the eggs in the centre of each layer of rice being now put at the edge. The tub is covered with a cotton mattress.

Choosing an Incubator.—For general purposes there are two types of machines: (1) Hot-air and (2) Hot-water. There are always people ready to ask which is the better. I may say that there is practically no difference between the two, provided well-known makes of each are selected. In the hot-water type of incubator (commonly called the *tank* machine) moisture must be supplied, which is not the case in hot-air or *non-moisture* incubators. The *hot-water* incubator is worked by a capsule regulator, which consists of two thin



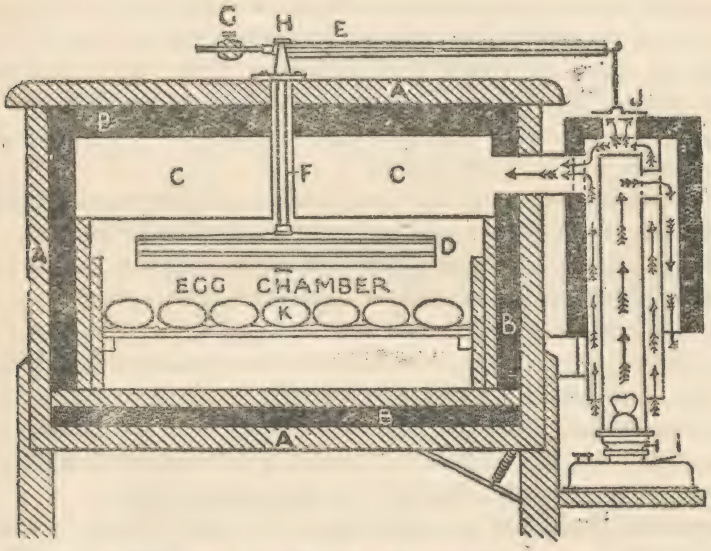
Sectional View of Hot-water Incubator.

(A) Casing. (B) Asbestos packing. (C) Tube to fill tank. (D) Tank. (E) Milled screw head for adjusting regulator. (F) Lead weight for governing heat. (G) Damper. (H) Lamp reservoir. (I) Capsule. (E–G) Lever bar, which raises damper actuated by the "rod" from capsule. (J) Stirrup supporting capsule. (K) Egg drawer. (L) Ventilation hole in floor of machine. (M) Water tray. (N) Canvas in water tray. (O) Eggs shown on zinc bottom to egg drawer. (P) Lamp chimney. (R) Flues, through which lamp heat passes.

metal plates fastened together round the edge, leaving a space in the centre between, which contains a liquid. When this liquid boils, *i.e.* at the approved temperature, it expands, causing the capsule to distend and work a lever which automatically raises the damper from the flue of the lamp. This action allows the surplus heat to escape from the incubator until the damper sinks again on the required heat being present in the egg-chamber. An examination of the accompanying sketch will aid the reader. There is a water-tank at the top of the

machine directly over the egg-chamber, and through this a pipe passes from the lamp flue to take the heat along.

The fresh air passes through ventilation holes in the bottom and sides of the machine, and passing over the water-pans becomes charged with moisture. Directly under the eggs in the egg tray (which has a perforated zinc bottom) is a piece of canvas or flannel, and this is kept damp by reason of its being over the water trays, which must be kept full of water. This is necessary to prevent the eggs from drying up. In some machines (see sketch of hot-air incubator) a bar thermostat



Sectional View of Hot-air Incubator.

(A) Casing. (B) Packing. (C) Hot-air chamber. (D) Thermostat. (E) Regulating arm. (F) Rod which actuates regulating arm. (G) Balance or regulating weight. (H) Milled screw for adjusting regulator. (I) Lamp and heater. (J) Damper. (K) Eggs.

is used instead of the capsule regulator, but both have the same duties to perform, and the latter is the more common.

As previously stated, no artificial moisture is applied in *hot-air* incubators. Although there are several methods of heating, in each the heated air passes from the top of the machine to the bottom, and not *vice versâ*, as is the case with hot-water incubators. A rapid circulation of air is thus prevented. In many machines the air passes through a heater without coming in contact with the fumes or lamp, and in its pure warmed state enters the egg-chamber through a porous diaphragm or felt and passes through another diaphragm beneath the egg drawer.

Although I have given it as a general rule that *hot-air* machines are *non-moisture* ones, certain makes provide moisture pans or trays. These are placed in various positions—above the upper diaphragm, under the eggs, in the egg-chamber, at the foot of the heater, etc. Readers should remember that much practical science has been brought into play in the construction of present-day incubators, and the "best" machine is the one that after persistent trials gives the most satisfactory results.

There is one widely-used incubator I have in mind that is neither a *tank* nor a *hot-air* machine. The heat in this make is supplied by a boiler and circulating pipes, the inventor aiming at a uniform temperature in every part of the egg-chamber by making the hot water circulate through the pipes all round the machine. Other designs I have met with consist of hatchers and rearers combined, where the same lamp-heat incubates the eggs and provides warmth for the chicks in the rearer (having run attached) below.

Mammoth incubators to hold from 6000 to 20,000 eggs have become very popular in the States, and several are used in this country. The principle is that of hot-water pipes running throughout the mammoth appliance. Then we have electric incubators, and accessories can be bought so that the machine can be run by gas instead of oil. The poultry-keeper is, indeed, well looked after as regards artificial hatching, and with each incubator sold the manufacturing firm sends out full instructions as to fitting and management, so that the veriest tyro is able to follow them. Remember that a good incubator goes a long way towards a successful hatch if the eggs are all right.

Mammoth incubators are quite easy to manage and can be run very cheaply, being heated by gas, coal, oil or coke. They are constructed in sections so that additional parts may be fitted on if necessary, whilst the machines work satisfactorily even if only half the sections contain eggs. There are great possibilities ahead of these mammoth machines, and for poultry-raising on big lines they fit in nicely on the farm with mammoth Brooder Houses, mammoth Intensive Houses, etc.

On Temperatures.—The temperature at which to run an incubator depends to a degree on that of the incubator-room. If the latter registers 60 degrees the machine should be run at 103 degrees, if 50 at 104, and if 70 at 102, and so on. One should aim at 103 degrees, allowing 104 as a possible, but avoiding 105. Should the machine get down to 99 degrees for a short time no harm may accrue, although hatching may be late.

Working an Incubator.—In starting a machine run it empty for a few days at 101 degrees, and then put in the eggs when it is steady at that degree of heat. Having fitted up the capsule and lever-rod by means of the screw-head at the top, regulate temperature by moving

the small weight along the lever arm or bar. Once the damper hangs loosely over the lamp flue at 101 degrees, screw down the weight on the lever arm. After a little time the eggs will begin to get warm, and the necessary 103 degrees will be registered by the thermometer in the egg-chamber. Be very careful not to run the machine at too high a temperature at the start, for this is a critical time, and the germs will perish if the heat is too much. The thermometer should be a little above the eggs, and not directly on them, else a false degree of heat will be registered. A trustworthy thermometer is essential, and every little instrument should be tested before use with a clinical thermometer. The degree of heat can easily be seen if an instrument that is L-shaped is used, one half being inside the machine and the other outside. A thermometer can be pushed through one of the holes in the drawer, and if a piece of string is attached to the end it can be quickly pulled out and examined. A red circle should be painted round the 103 degree line, if not already there, to help the operator to read the thermometer quickly. To make the capsule more sensitive some operators fit a soft felt corn-pad directly underneath and in the stirrup.

Never over-fill the egg-drawer or add fresh eggs once the machine has been started. Only the best oil should be used, to ensure an even lamp-flame. The lamp should be filled daily—although it is advisable to use a self-supplying lamp that holds sufficient oil to last the hatch out—and the wick trimmed. Never cut the wick, but round it off with the fingers. Attend to the lamps in the morning, so that an even flame will be present at night to see the machine safely through the small hours. Occasionally have a glance at the thermometers throughout the day to see that all is well.

Cooling and Turning.—After the eggs have been incubating thirty-six hours or so, turning should commence. The eggs should be turned and cooled up to the eighteenth day, when they should not be touched. Varied are the opinions as regards turning the eggs. Personally, I think that by turning the eggs twice a day they will get sufficient cooling. Never take the egg-drawer right out when attending to the eggs, or the machine will cool down and harm may accrue. Let the drawer lodge on the bench or place a wide piece of wood under the machine and on the bench opposite, and rest the drawer thereon. To turn the eggs take the centre row out and roll the eggs in one-half of the drawer gently down. Next replace the eggs that were in the centre on the outside. Then take out the row nearest the centre on the other side and roll those eggs down, afterwards putting the eggs previously removed on the outside. Some operators mark the eggs with a X on one side and an O on the other, and turn the eggs from one letter to the other. Turning is essential to prevent the contents of the eggs

from sticking to the shells. How long this turning and cooling should last will depend upon outside elements and the length of time the eggs have been incubated. Start with five minutes or so, and then be guided by the touch of the eggs. So long as they feel warm all will be well. An incubator chart should be hung up on the wall over each machine, the date the eggs were set being marked thereon, together with the number or make of incubator, number and breed of eggs set, date due, number of unfertiles and dead-in-shell, number of chickens hatched, etc. These charts should be kept for reference. Test the eggs on the seventh and fourteenth days, and remove unfertiles, using them for the chickens with bread-crumbs. Do not prolong the testing period; if you are slow cover the eggs with a flannel. When the chicks hatch put them in the drying box.

The above hints are general, for equipped with the special descriptive literature sent out with each particular machine by the makers, the novice cannot misunderstand the advice given for his guidance. *Cool* eggs up to the time the first one "pips," but stop *turning* after the eighteenth day. With *hot-air* machines the egg-trays must be removed when the eggs are being cooled and turned. The machine should at such times be closed up so that when the egg-tray is replaced the heat in the incubator will regain its correct temperature as quickly as possible. In many makes the egg-tray is square so that it can be reversed each time the eggs are turned, those at the back of the machine in the morning being in front at night. Again, some egg-trays are flat, whilst others are "dished."

Dead-in-Shell.—Many have been the remedies suggested for this troublesome bugbear of artificial hatching. Although many may not agree, my contention is that the fault in the majority of cases lies with the parent stock, and incidentally their owner. Given sound-shelled eggs from healthy, well-fed, and properly-mated birds, there should not be an excessive number of dead-in-shell. The trouble may happen during any part of the period of incubation and may be caused by adding fresh eggs after the machine has been started. One operator declares that it is due to our unnatural method of testing and handling eggs on end instead of flat on their sides—the only natural pose. Our present method he considers drowns the chick on account of the partly-devoured yolk being broken. His arguments are, indeed, logical. Another man considers that it is the excessive degree of heat on the tender walls of the air-cavity that causes dead-in-shell, and has manufactured protection caps to fit on the thick end of the egg. There is room for experiments here, to be sure.

Between the Hatches.—At the beginning of the season incubators should be thoroughly overhauled. Tanks should be tested for leakages by the operator blowing down the filling tube; if the bottom is inflated

there is no leak. Test thermometers, boil all burners, and well clean the lamps, etc. Keep a stock of capsules handy and use fresh ones where necessary. Never trust to chance! Well clean out the incubators after each hatch and always dry down the tank when the hatching season is over and thoroughly overhaul and clean the machines and parts. A little borax can be added to the water in the tank to clean the bottom and sides. Overhaul and clean the heaters in hot-air machines, owing to the deposit caused by the lamp-flames. Having cleaned out an incubator after a hatch run the machine for a day at a steady 101 degrees before the next lot of eggs is put in.

CHAPTER V

Rearing: Natural and Artificial.

THERE are several methods of rearing chickens. From the time they see light of day the little chicks may be (1) entrusted to mother-hen, (2) placed in a foster-mother, (3) quartered in a fireless brooder, or (4) placed in a heated brooder house. In this chapter I propose dealing with hens, foster-mothers, and fireless brooders, leaving the mammoth brooders for a later chapter. The method of rearing and management of the chicks must be according to local conditions and circumstances.

The Mother-Hen.

Early broods—Full broods essential—Coop and run—The rearing ground—Care of the mother-hen—Care of the chicks—Transferring chicks to coops.

Early Broods.—In cold weather chickens require a little different management than when the elements are favourable to rearing. Early broods will come to harm if placed with the mother-hen out in the open. Both hen and chicks should be accommodated in some snug out-house under cover, and no better accommodation can be named than a well-lighted barn where the chicks can romp over the littered floor. A loft, too, provided it is well lighted, will do nicely. Foster-mothers are usually brought into play for the very early broods, and not a few rearers place these in out-houses under cover. Such an arrangement makes it possible for the little chicks to run about and scratch, no matter whether snow is a foot deep outside. A good plan for the early-hatcher is to place a hen and brood—the mother can be cooped, of course—in a well-lighted scratching shed or sleeping-house (removing the perches in the latter) that is not in use for adult stock. The backyarder can section off a part of his covered-in run for any early brood that may be hatched; in this case, too, the mother can be cooped. Even when the coops are placed in the open early in the year sheltered spots should be selected and rough shelters placed here and there in the rearing ground.

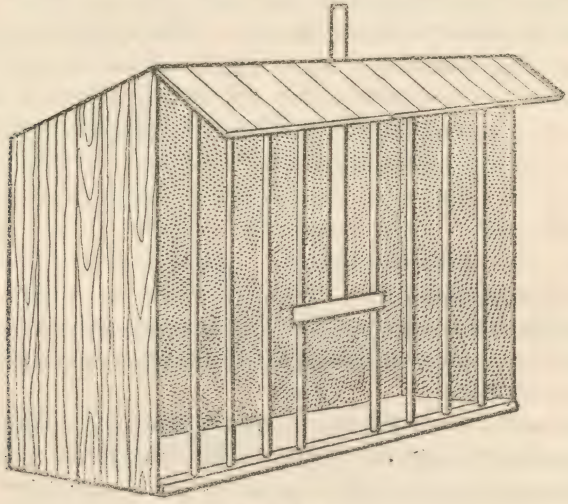
The Rearing Ground.—In planning a farm so much ground must be reserved for rearing purposes. An acre or more would not be too much where chicken-rearing is carried out on extensive lines. It is a wise plan to plant fruit bushes all over the rearing ground. Let me give you an idea of what a rearing ground looks like when the hatching season is in full swing. On one side will be a range of foster-mothers with wire-netting enclosures (four feet high). These runs will be fastened to stakes hammered into the ground, and when the grass gets worn they can be rolled up and transferred to the other side of the fosters. By this arrangement the ground can be rested and the chicks provided with fresh grass. Each enclosure may be ten yards or more each way, and the operator can step over the wire-netting when he wishes to enter the run. The range of foster-mothers will be placed under the shelter of some hedge or belt of trees if possible ; but, of course, not directly under the same. Dotted all over the rearing ground will be scores of coops, each holding a hen and her brood. These coops will be placed in a line for neatness with a few yards between each, the distance depending on the ground space at the disposal of the rearer. The coops will be moved to fresh ground each day—a little way from the old site. Fruit bushes and shelters will provide shade and protection from the elements, whilst against the front of each coop, when the weather is wet, a piece of zinc will be placed to form a little archway for the chicks to make use of instead of having to run out in the rain.

The grass round coops should be cut short, as it is harmful for chicks to run out in very long wet grass. This long grass naturally holds the dew of the early morn, and is not dry till the sun gets up. Fresh rearing ground should be selected each season, and by using the top half of the rearing ground one year this can be rested the next whilst the bottom half is used. Well lime any ground that has been used for rearing purposes, and sow a crop of clover or lucerne thereon to sweeten it. In the busy rearing season hens can be penned with their broods on the grass walks between the breeding pens, etc.

Full Broods Essential.—It is ridiculous to run small broods with hens, as so many do. Why, I ask, should a hen waste her time over three chicks when she could be caring for a dozen ? Rather give the three to another hen and get the broody thus dismissed to lay again. In warm weather a large hen can manage fifteen chicks with ease, as they will be happy if they can only get their backs under the mother's fluff. In giving a hen extra chicks keep strictly to colours. Give one hen all black chicks and another white ones ; do not place two black ones with a brood of whites, as the hen may kill them, since she can tell the difference between the colours. Even the backyarder errs in allowing hens to have small broods. It is a good plan to order

from a day-old chick specialist half a dozen chickens to be delivered on the day the hen is due to hatch. Should the hen only bring off six or seven, the newly-purchased chicks can be placed with them. Give this matter of *full broods* your careful attention, for it means the loss of many eggs if broodies are allowed to have but two or three chicks each. They are better laying than idling; speed up things in all directions, Mr. Poultry-farmer!

Coop and Run.—For poultry-farm work an ordinary coop is usually adopted. The hen is confined to the coop, the centre stay being made to slide up and down. The little chickens can run out at leisure through the spaces between the bars, but the hen cannot get out unless



HEN-COOP.

she is liberated by pulling up the centre bar. A run can easily be constructed to fit the hen-coop if desired. The sides and end should be of wood or thin-meshed wire-netting, and the top of wire-netting fitted on a stoutish framework. The end nearest the coop is open, so that the run can be placed right against the coop. A door should be fitted in the top so that the rearer can take out any drinking or feeding vessels from the run.

Where the coop is placed in the open backyard a run is necessary to confine the chicks in and protect them from cats. A run can, of course, be provided to coops used on the poultry-farm, but this means additional expense, as a dry run can be formed, as already mentioned, by placing a sheet of zinc against the front, so fixing it that the wind does not blow it down on the chicks.

March winds should be guarded against at all turns, and the wise poultry-keeper will put in a few extra supports to wire-netting where

necessary, and nail all pieces of zinc, etc., securely down before any damage is done.

Where a coop and run are specially constructed for farm work they should be made in one, and under one roof, after the nature of a foster-mother and run, or a miniature backyard house and run. The spars of the coop will look towards the run, and the chicks will have a kind of exercising place under cover. They can gain access to the outer grass range through a trap-door at the end of the run. The slanting roof can be made or hinged to open for cleaning purposes, and a door can be fitted to the compartment where the broody is, *i.e.* in the front. The run will be boarded on all sides except the front, which will be thin-meshed wire-netting; the coop section will be completely boarded in except for the sparred entrance facing the run. On wet days the chicks can be confined to the run, the trap-door at the end being closed.

The coop must be securely closed up for the night to protect the chicks, and a wooden sliding front can easily be constructed to achieve that object. Ventilation holes must be bored at the top of the sliding-front. Many deaths are caused through the rearer not letting the chicks out early. The hen gets restive at hearing her babes crying to be let out and ends up in crushing some by stepping on them. Again, some coops are so closely boxed-up that the chicks cannot see to dodge those clumsy feet of their mother. If a small glass window is fitted in the centre of the sliding front these deaths will be prevented and the rearer may be the richer at the end of the season by as many as 200 *live* chicks. It is surprising how deaths soon tell up, even though but two chicks are found dead in the coops each morning. Fit a hood to each coop to provide shade and protection for the hen, and make them nice and deep for the same purpose. All coops should face south.

Care of the Mother-hen.—Whilst the chickens require plenty of attention, the rearer must not forget the mother-hen. Study economy by all means, by feeding the chicks in troughs well away from the hen, so that she does not eat up her brood's food, but see that she gets plenty of ordinary food. Treat her as a kindly old dame, not as a creature only fit to brood chicks. See that she has plenty of drinking-water always within reach.

Care of the Chicks.—It is a good plan to place shelters here and there in the rearing ground. They may be of any design, although A-shaped ones are to be preferred. Both ends should be open, the chicks running underneath for shelter, both from inclement weather and the hot rays of the sun. Feed the soft food in troughs well away from the mother-hen. If the hen is running loose with the chicks, construct an oblong kind of box arrangement, the sides consisting of

bars with narrow spaces between. The chicks can run underneath through the bars to get their food, but the hen is prevented. A small wire pen after the nature of a cage will answer the same purpose, sufficient space being allowed for the chicks to get through the wires. The rearer's common sense will help him overcome any obstacle; it will tell him, at any rate, that it is costly to feed the mother-hens on chicken foods.

Transferring Chicks to Coops.—When transferring chicks to the coop carry them in an apron, wrapping them in flannel if the weather is cold. Carry the hen under the arm, or obtain the services of a second person. When the hen has been shut up in the coop be careful how you give her the chicks if she is excited. Try not to make the chicks chirp by handling them gently. In the case of a wild hen, to prevent her from stepping on the chicks, hold her firmly against the side of the coop, and then put the chicks into the box and gently release the hen. If she shows fight hold her firmly until she gives way. In approaching a broody hen, whether she has eggs or chicks, hold the *palm* of the hand towards her, as her peck will not hurt. Some hens *can* peck, and it is not nice to have a piece out of the tender parts of the *back* of the hand. This would probably make the poultry-keeper lose his temper, and the successful rearer never does that.

In some makes of incubators the chicks come to the front of the egg-chamber—being thus attracted by the glass panel—and drop down into the chick-chamber. In other makes the chicks must be removed by the operator directly they are out of their shells and placed in the "drying" box, or chicken-chamber, at the top of the machine.

The Fireless Brooder and Brooder House.

Rearing without artificial heat—The coming of the Intensive System—The fireless brooder—The brooder house—In a nutshell.

It would not be incorrect to say that the Intensive System of poultry-keeping owes it origin to the little fireless brooder for which wonders are claimed by American poultry-keepers. This American system may be divided up into the following four stages: (1) Fireless brooder; (2) Brooder house; (3) Small backyard Intensive house; and (4) Mammoth Intensive house. Why all these should be bracketed together it is hard to say, but there they are. When Mr. E. W. Philo, of Elmiro, U.S.A.—the originator—brought out the System, it immediately caught on, and his "Intensive" work ran into eighteen editions in four years. A few years ago one of my poultry friends confided in me that for a long time he had been working secretly on fireless

brooders, and asked me what I thought of their chances on the market. I pointed out that anything new would be looked upon with suspicion, but added that I considered the System sound enough to merit success. Eventually I was escorted over his farm, and later introduced his fireless brooders to the poultry public. Since then my pen has been busy scribbling "Intensive" notes. The fireless brooder has not met with the success it might have done, owing perhaps to the need for scientific management, but that in good hands it cannot prove a failure I have not the least doubt. I have seen many hundreds of *fireless-reared* chicks in cold February scampering about like rabbits.

I still think that the *fireless brooder* is worthy of more experiments, as the advantages to be gained by its use are so many. Labour is reduced to a minimum; fumes, lamp troubles, fires, etc., are absent, whilst there is the saving in oil. In these days there should certainly be a wooden rearer where artificial heat is not necessary, and for the above reasons I would like to see poultry-keepers solve the problem. As regards the *small brooder houses*—dealt with later—I consider them most useful for farm work. Whilst I do not see a great deal in the small *backyard Intensive houses*—to which I refer in a later chapter on "Housing"—I think highly of the *mammoth Intensive houses*, for the reasons I mention in Chapter X.

The Fireless Brooder.—The fireless brooder is the artificial box or mother used in conjunction with the small brooder house described further on in this chapter. As its name shows, no artificial heat need be provided. There are many designs now on the market, all having the same principle but each a little different perhaps in detail. A box eighteen inches square and ten inches deep—to accommodate fifty chicks—forms the outer casing, stoutish wood being used. An inner framework is fitted in this outer casing to make the brooder damp-proof, an inch space being left all round. This space is packed with straw, cotton wool, felt, or similar material well pressed down. A piece of oilcloth or roofing felt can be nailed to the bottom of the brooder—both inside and out—to prevent the damp from striking through. To prevent the chicks from crowding into the corners a piece of rounded wood is fastened in each for about three inches or so from the bottom. As regards the principle of heating, in the original Philo brooders cushions were used, but some of the critics wrote against these, as the sweat from the chicks soaked them through by morning. Then layers of felts were tried with success, whilst eider-down quilts or quilted cushions, each about one inch thick and filled with cotton wool, have been recommended.

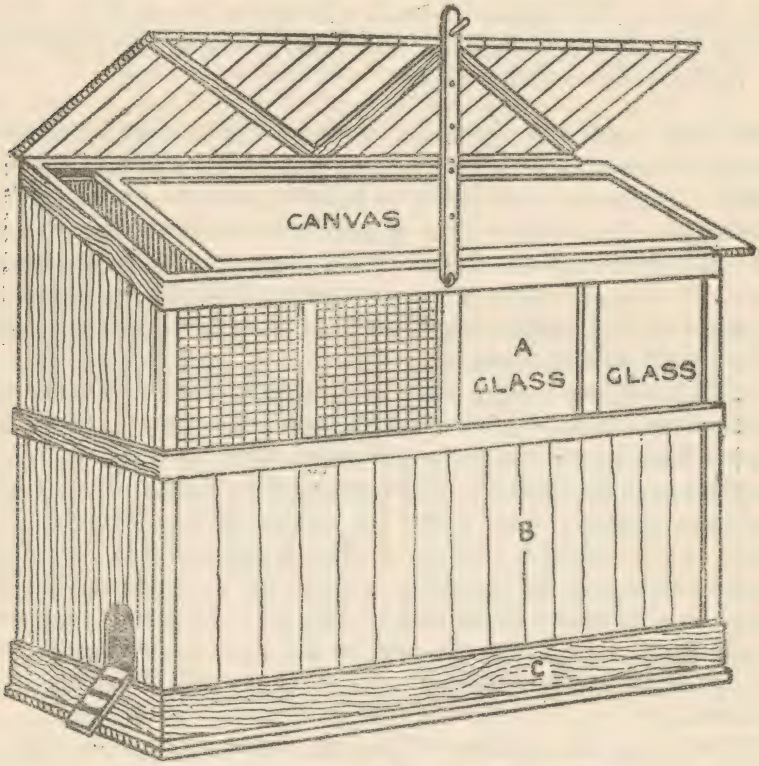
A number of felts, cushions, or quilts must be used, five or so in very cold weather, reduced to one or two, and finally none as the weather improves, and also as the chicks get older. These quilts or felts are

placed on a framework, the latter consisting of a wooden frame, across which a piece of flannel is nailed, allowance being made for the flannel to sag loosely in the middle to drop on the backs of the chicks. This framework is kept in position about three inches from the bottom of the brooder by a narrow strip of wood nailed all round the brooder on the inside. Any handy-man can make this framework adjustable so that it can be lifted as the chicks grow. Two sets of quilts or felts are advisable, so that one set can be in use during the daytime whilst the other is put out to dry and get well aired.

Next we come to the lid, which should be detachable and made to fit securely on the top. Two handles should be fitted thereto, and in the centre a ventilation hole five by four inches must be cut, the aperture being covered with perforated zinc. As regards the front, an entrance about three inches square must be cut for the chicks at the bottom, narrow slips of felt hanging over this entrance or door. On either side of the latter a ventilation hole two and a half inches square (and covered with perforated zinc) must be cut. The brooder box is now complete except for the litter. Place a thin layer of sifted soil on the bottom of the brooder box, and over this a layer of chaff or peat moss. Coax the chicks to enter by gently pushing them through the door or entrance. A small glass window (about four inches square) can be fitted in the side of the brooder directly opposite the entrance to give the little ones courage. Ventilation holes similar to those in the front can be fitted in the back of the box. Sprinkle the felts occasionally with Izal powder. Starting with fifty chicks in a brooder such as described, gradually reduce the number as they grow up until there is but room for fifteen large well-grown chickens with the felts taken out of the brooder and only the top or lid left. If necessary, a larger brooder can be brought into play to accommodate the larger chicks. Ultimately the chicks will be too big to occupy the box, or the weather warm enough for them to do without it when the brooder box can be removed, and the chicks allowed to occupy the brooder house as described below.

The Brooder House.—This appliance is in the nature of a two-compartment coop or accommodation. It is divided in the centre by a movable partition, one section being the sleeping compartment and the other the scratching section. The former has a wooden floor, whereas the latter has an earthen one, over which is placed any litter, such as chaff or peat moss. The roof is hinged and held up by a stay, which when the roof is closed folds neatly underneath it. By means of a pin pushed through any of the numerous holes in the stay the roof can be kept open as wide as is advisable according to the weather. Under the roof there is a sliding framework of wire-netting with canvas nailed over it. This frame slides along to admit fresh

air, and yet protects the chicks from draughts. The measurements for such a brooder house would be seven feet long, three feet wide, and two feet nine inches high in front. The fireless brooder is placed in the sleeping compartment and the chicks run through a hole in the partition into the scratching section, and can pass out through a trap-door at the end on to a grass range if the same is handy. The front covering the sleeping section consists of glass panels, wire-netting being used for that part covering the scratching compartment, a regulating



THREE-SECTIONED BROODER HOUSE.

shutter covering the netting. As the chicks grow the fireless brooder or mother is taken away and the chicks allowed to sleep on the floor of the sleeping section.

It will be as well for the reader to refer here to the sketch given of a three-sectioned brooder house. The brooder previously described is made in two sections: A top, and C framework. As the chicks grow up the fireless box is removed as stated, also the centre division and a third or middle section, B, is added. The sections are tongued and grooved and slip on quite easily. By the addition of this middle slip-on section we have a respectable accommodation for well-grown

youngsters, and perches can be fitted up inside. Such houses as they stand would prove very handy on any farm where a goodly number of young stock is reared each year. The middle sections need not lie idle, for they can be covered with wire-netting frames, and, with a trap-door fitted in each end, will make suitable runs for chicks.

The Foster-Mother.

Litter for floors—Introducing the chicks—Question of temperature—Hardening off—Over-crowding and Over-heating—Filling the lamps—Mammoth brooders—Management.

As with incubators there are two types—hot-air and hot-water—so with foster-mothers. Artificial rearing with foster-mothers is not so difficult as some would have us believe, provided over-crowding is avoided and the proper degree of heat is maintained. Given a good make of foster, half the battle should be won. Foster-mothers are made with two or three compartments: (1) heated compartment; (2) run; or (1) heated compartment; (2) run with wooden floor; (3) run with earthen floor.

Litter for Floors.—I am not a lover of wooden floors to runs where chickens are concerned, as leg-weakness and cramped toes usually follow. The floor of the heated chamber must naturally be of wood, but litter such as chaff should be scattered to a good depth thereon. Sand, too, makes a good litter for wooden floors. The second run should be littered with chaff if the floor is composed of wood, whilst the third section or run should be of sifted soil to a nice depth. There should be a trap-door at the end for the chicks to run through on fine days to the outside grass. On cold or wet days the little ones should be confined to their fosters. Peat moss is an excellent litter for foster-mothers.

Introducing the Chicks.—When the foster-mother is ready the chicks should be taken from the drying-box of the incubator and placed inside the heated compartment of the foster. They should be left for a few hours, when the operator should encourage them to come out to feed in the run-section by pushing them gently through the entrance or door. Persevere, and after they have fed, drive them gently back again through the aperture. Repeat this operation at each feeding time, and the chicks will soon know where the door is.

Question of Temperature.—A temperature of 90 degrees for the first week is considered correct for heated compartments, and it should be 10 degrees less each subsequent week, until the chicks can do without the heat. Weaning must be gradual, and after the chicks are deprived of the artificial heat by day the lamp should be running

at night for a time to harden the chicks off. The thermometer during the third week should read 70 degrees, but in cold weather this can be kept up for the fourth week instead of being dropped to 60 degrees. The bulb of the thermometer should be about two inches off the floor, as the higher it is placed the more deceiving will be the temperature. The latter must be tested where the chicks are, viz. on the floor. Do not place the thermometer near the open door or in the corner furthest from the door—two extremes. Place it midway between these two points.

Over-crowding and Over-heating.—Never over-crowd the foster-mother. Even if it is advertised to hold a hundred chicks, place less than that number in, say eighty. If the chicks are comfy, they will not crowd together, but sit down shoulder to shoulder, as it were. If the brooder is under-heated, they will stand up and crowd together. It is not good for the chicks to be in the brooder too much; out-door exercise is essential. If they insist on keeping inside the heated chamber the latter is under-heated. Where the temperature is right the little chicks will have a little warm and then a run-out.

Hardening Off.—When a month old the chicks should be bonny little fellows, and after enjoying a temperature of 60 degrees for the fourth week, only at night should they require artificial heat. At eight weeks old they can be placed in a cold brooder—a cockerel-box type of a house or small brooder house (see description in this chapter) will do nicely—where no heat is provided. This will harden them off as it were, and when they grow too big for the cold brooder they can go into proper poultry houses and be allowed to perch.

Filling the Lamps.—Only the best oil should be used, and the lamp should be attended to in the day-time so that an even flare is ensured for the night. Trim the wick by rubbing off the charred portion to obtain a steady flame and examine the lamp half an hour after attending to it and just before going to bed to see that all is in order. When seeing to the lamp clean the perforated portion of the burner to remove any particles of dust. Aim at a steady flame, not a *forked* one. Foster-mothers should be run for a day before the chicks are placed therein. This precaution should be taken each time if the best results are to be obtained.

Mammoth Brooders.—Mammoth brooders have in recent years come to the fore. Mammoth brooder houses I propose dealing with in a later chapter, but what is known as the "Colony" brooder deserves attention here. This is in the shape of a large house and has a heater in the centre. One design I admired held three hundred chicks, and the heater consisted of a stove (burning anthracite coal), over which was a large hover with hanging strips of felt all round, under which the chicks sheltered. In some American designs of brooders

there is the heater in the centre, which sends out great warmth. The chicks sit on the floor as near the heater as it is possible to get. They thus regulate the temperature for themselves. If the heat is too much the chicks hang back a bit; if too little they come towards the heater until they get into the proper zone of warmth. A trap-door in these "Colony" houses permits the chicks to have a run out on the grass.

CHAPTER VI

From Chicken-hood to Pullet-hood.

List of toe-punch marks—Feeding from one-day old—From rearer to cold brooder—From cold brooder to poultry house—Shade and shelter—Care of exhibition youngsters—Sorting the culls—Marketing surplus males—When chickens ail—Pullet-hood.

THE handling or management of young stock from chicken-hood to pullet-hood is an all-important subject. The future of every bird depends, as it were, upon the schooling it receives from the time it leaves the shell. Young stock must ever be kept growing and progressing if eventually they are to prove a credit to the rearer. If a bird is under-fed or carelessly handled during the growing stages no amount of extra care and attention once it reaches maturity will put things right. A puny, badly-reared pullet is useless as a layer or breeder, just as an undersized cockerel is only fit for the pot. For the above reasons give all young stock every care and attention during the growing stages.

Toe-punching Chicks.—It sometimes happens that the breeder wishes to keep an eye on certain young stock, in which case guesswork is fatal. The chicks must therefore be marked in some way when hatched. There are two methods of marking chicks: (1) by toe-punching; (2) by the use of leg-bands. Below I give a list of toe-punch marks that should help the breeder who works on systematic lines. Toe-punches are made in several designs, and may be had cheaply of most poultry-appliance firms; the small ones are best, as being easy to work. By pressing the sides of the little accessory a needle passes through the web of the chick's foot, leaving a neat little hole right through, which increases in size as the bird gets older. No pain is attached to the procedure, and it is all over in a second. If we wish to mark the chicks from Pen 3 we pierce one of the webs of the right foot; if the chicks are from Pen 16 the two webs on each foot are pierced. Those who line-breed and must know how the chicks are bred will find toe-punching a boon. A stud-book is kept in such cases, giving the matings and punches.

Suppose, for instance, we wish to know the chicks from Pens 1, 2, and 3, in Rhode Island Reds, when they are matured—to prevent, say, in-breeding the next year—what is a more accurate method of marking them than toe-punching? If, too, we wish to know the progeny of an extraordinary layer, this system of marking is imperative. In breeding for heavy egg-production males from heavy-laying mothers should be used, and the toe-punch marks will help us when we are sorting over the "likely" males to head the various pens. Another method of marking is by the use of different coloured leg-bands—whether plain or numbered. The disadvantage of these lies in the fact that several changes of rings have to be used to carry the birds to maturity. Only when the bird has finished growing, as it were, can one select a ring for use afterwards. The legs of newly-hatched chickens vary very much in size, and the small rings, if unnoticed, will cut into the legs and cripple some of the wearers. In a week or two the little chicks require larger rings, and a third change is necessary still later. The best plan is to toe-punch the chicks when hatched, and ring them with leg-bands when they have grown and can always carry the same circlet. All breeding stock should wear coloured circlets—say *red* for Pen 1; *white* for Pen 2; and *blue* for Pen 3. The progeny when old enough can carry the same coloured circlets as used for their parents. When mating time comes round we shall know that birds wearing the same-coloured leg-bands must not be mated together. If one wishes to mark the progeny from a *red*-circletted cock and a *yellow*-banded hen, the youngsters would wear red and yellow circlets, etc.—the yellow on one leg and the red on the other. As readers will have pet theories as regards breeding, I must leave the system of using the leg-bands to them.

LIST OF TOE-PUNCH MARKS.

FOOT			FOOT		
RIGHT	LEFT	PEN Nº	RIGHT	LEFT	PEN Nº
		1			9
		2			10
		3			11
		4			12
		5			13
		6			14
		7			15
		8			16

Supposing, when filling the egg-drawer to my incubator, I noticed a few very large dark-shelled eggs! I should know that the layers of those eggs had certain merits above other hens, and that if I used *cockerels* from those eggs I should increase the depth of colour in my strain. Those deep brown eggs, then, would be kept together by being wired off from the other eggs in the egg-drawer. When the chicks hatched all would be especially toe-punched and "circletted" later on. The cockerels I should use as breeders. If I knew the

layers of the original eggs one of the cockerels would be mated to any of them that were of the same breed and unrelated.

Feeding from One-day Old.—Chickens require feeding "little and often," "early and late," whilst regular times for meals should be adopted. It is a mistake to feed chickens before they are thirty-six hours or so old, as Nature has supplied them with food to last till then in the shape of the yolk in the egg. The first feed should, peculiarly enough, be fine gritty sand. For the first few days give finely-chopped, hard-boiled egg and breadcrumbs moistened with milk, using up all unfertile eggs from broodies or incubators. Bread and milk dried off with pin-head oatmeal can be given later and then discarded for biscuit-meal, bran, and middlings. The former two should be well scalded with boiling water and then dried off with the middlings. For growing chicks nothing can beat pin-head oatmeal, and this should be included in the rations always. Variety is essential, for the reader would not like to have bread and cheese for dinner seven days out of the week; it is the same with the chicks.

The soft food must be given in a *dry crumbly state* and fed in troughs, which must be kept scrupulously clean. A little meat can be added to the soft food, as can bone-meal, which is an excellent frame-builder. *Soft and dry foods should be given alternately, the last feed at night being corn or "dry" food.* As regards the dry feeding, the chicks should be fed on small chicken seed at the start, this being followed by half groats, half or split wheat, split rice, etc., until the little ones are old enough to have whole grains, such as wheat, groats, dari, buckwheat, millet, rice. As they grow up wheat and oats (and a little maize occasionally) make good grains to carry them on to maturity. Boiled rice, table scraps, boiled vegetables, etc., can be used in the soft mash as a change. Green food is essential where the chicks are confined, the following being suitable: onions (minced), nettles (boiled and added to soft food), mustard and cress (can be grown in quantities in shallow boxes), lawn clippings, lettuce (minced), etc. Drinking water is essential from the first and a plentiful supply should always be at hand. It must be perfectly fresh and the vessels should be placed in the shade out of the rays of the run. Regularly clean out the drinking vessels and place a few rusty nails therein to "iron" the water, and so provide the stock with a tonic. Milk, whether fresh or skim, can be given occasionally with advantage in place of water. Always cut up greenstuff also bacon rind fine, to prevent crop-troubles. That is why it is harmful to give chicks long, uncut pieces of grass.

Provide the chicks with plenty of grit and add a little powdered charcoal occasionally in the soft food to correct stomach troubles. Keep the chicks on the hungry side and always *with an appetite*; remove any food not eaten up clean. Scatter the dry food in litter,

as exercise is an excellent health-promoter. As regards the number of feeds per day, feed every two or three hours the first week ; five times a day till the fourth week ; four times daily till three months, and then three times a day. Dust the chicks with insect-powder occasionally, and once a month sprinkle a little Izal or disinfectant fluid in the litter and on the floor of the rearer. If the reader is accustomed to let his hens run loose with the chicks owing to few broods being reared, let him coop the hen up for the first week or so till the little ones get strong on their legs. Drinking (self-supply) fountains are cheap and most useful, and have the advantage of providing plenty of water for the chicks. Never allow drinking vessels to run dry as the chicks will only drink to excess when they are refilled. Wire off from all poultry stock any stagnant pools. Dry bran can be kept always before the chicks, the supply being placed in a shallow tin, the latter being nailed to the side of the coop a little off the ground.

The object in feeding chickens should be to feed first for a framework and then for flesh. A good frame can take flesh ; not so a weak one. Do not give too much soft food until the bird has got the desired frame. Neither give too much grain or the chicken will be stunted in growth ; find the happy medium.

From Rearer to Cold Brooder.—Where chicken-rearing is extensively engaged in sufficient ground must be allotted to the young stock to see that they have a regular change. There is nothing like exercise and free range for the youngsters. From the time the chicks leave the rearing-ground they require careful handling. The chickens will be ready to leave the foster-mothers at eight weeks old and must then go into cold brooder houses. Large grass runs will be necessary, and in these there should be placed a number of small houses or brooders, not artificially heated and minus perches. It matters little what the designs of these may be so long as there are sufficient to house the youngsters without over-crowding. A scratching shelter should be placed in the centre so that the youngsters can scratch about in the litter and retire into the shelter when it rains. When planning out a poultry-farm always allow for a range of large runs, each say twenty-five or thirty yards square—they are essential for young stock.

When the chicks are two months or so old and ready for the cold brooders they should be sorted into sexes, one hundred pullets being placed in one run and a like number of cockerels in another. It is foolish to allow the males to run with the females, for the former are such greedy and spiteful beggars, and by devouring more than their own share of the food do not give the pullets a fair chance. Keep all houses or accommodations used for young stock regularly lime-washed within. As the youngsters grow and get too large for the small brooders they must be shifted to fresh runs, keeping those of the same

size together for all to get an equal chance, where larger poultry-houses are provided. In the case of chicks with hens, do not in favourable weather let the hen coddle them too long. Let the broodies go back to their laying houses for "active service" in the laying line, and place the chicks when of a good size in the runs containing the "accommodation" or cold brooders, *i.e.* after the sexes have been parted.

From Cold Brooder to Poultry House.—When the youngsters are several months old and ready for perching they should be placed in large grass runs where large poultry houses are installed. The sexes must still be kept separately penned and the owner can overhaul the cockerels and market any surplus ones. In these runs up to fifty birds may be kept, provided they are not over-crowded in housing. Duplicate runs can be provided, the young stock having the use of one enclosure one week and another the next, thus resting the ground. At the time the owner is looking after the young stock of this age his adult stock will have been decreased by the disposal of the older hens which the young stock are to replace, so that he can give the growing chickens ample attention. Many breeders run two houses under one roof, a centre length of wire-netting dividing off the two runs. Arrangements can be made for the youngsters to occupy both houses and runs, one enclosure being closed to the chickens whilst the other is in use.

It is for the housing of the growing stock as now being dealt with that the mammoth Intensive houses are especially useful. Such handy structures—whether to hold, 50, 100, or 500 young birds—can be built out in the field near a natural spinney or placed in the centre of large grass enclosures. They could take the pullets right up to maturity, and if necessary act as their winter laying quarters.

Pullet-hood.—It will be seen from the foregoing remarks that a bird has to be handled carefully till pullet-hood is reached. The young stock should be graded regularly, *size being taken into account as much as age*, and wasters culled and removed. The most promising pullets will be reserved for breeding to replace the adults that have been disposed of according to the poultry-farm's principle of half pullets and half young hens. Those pullets that are over after the required number has been selected may be sold in the autumn at remunerative prices or retained for winter laying. The selected ones should be sorted out into small flocks and placed in the smaller houses and runs as usually seen on poultry-farms. If there are runs with larger houses to hold twenty or so pullets so much the better, as the pullets can occupy these till required for breeding. Pullets are very shy creatures when on the point of laying, for which reason the nest-boxes should be fixed up on a dark side of the house, and they should be kept well stocked with nesting material.

The cockerels will have to be sorted out, the selected ones being

reserved for breeding with *unrelated* adult hens, the adult males that have not been disposed of being kept for mating to unrelated pullets. Having picked out the cockerels required and one or two over in each breed for emergency's sake in case a male may ail and die, get killed by fighting, or not fertilise the eggs, the remainder can be advertised and sold for stock purposes. There is always a keen demand for pullets in the autumn at top prices, also for male birds where the strain is good.

Shade and Shelter.—Young stock require shade from the hot rays of the sun and shelter from wind and rain. Thatched hurdles will make up into nice shelters, and plenty of the latter should be dotted here and there over the rearing ground. Early in the season the hens and coops can be placed under shelters composed of thatched hurdles to protect the hens and broods from the unfavourable elements. When March winds are about fix a few thatched hurdles upright in the ground here and there to turn the winds. Make full use of all natural shade. An enclosure dotted with small fruit bushes makes a suitable rearing ground. When the chicks are growing make use of any natural wood or spinney where there are no foxes, placing the houses a little way from the spinney and allowing the young stock free range into the wood; they will thrive apace on the grubs they find and will be well shaded and protected. In Yorkshire, Derbyshire, etc., small spinneys are very common, and most poultry-keepers make use of them, especially for young exhibition stock that require plenty of shade for the preservation of their plumage.

Care of Exhibition Youngsters.—Exhibition chickens naturally require a deal of attention, for it is not likely that the owner wishes to lose a bird that may be worth £10 or £20 when matured. Many otherwise champion young birds fail by being on the small side. Do not let young stock look back, for remember that "a good big bird will beat a good little bird every time." Size may even determine whether a youngster is worth 6*s.* or £6. Heavy-combed chicks, such as Minorcas, Leghorns, etc., must not be with the broody hen after their combs begin to shoot, or the weight of the hen will turn the combs over. In such breeds as the Wyandotte, where the leader to the comb must follow the arch of the neck, a comb-guard may be necessary and can be purchased from any appliance firm. These guards are made in different shapes to fit the various combs. Large-combed young pullets (Minorcas, etc.) are usually placed in heated houses to develop their head points, vaseline being rubbed on the comb every other day and the comb worked with thumb and finger from the base to the serrations. Naturally it would not do for a big-bodied Minorca pullet to have small, undeveloped headpoints. The lobes of Minorcas and Leghorns are similarly worked after being bathed in warm water and dried with a towel.

Meat is an excellent comb-grower, and whilst it is dangerous to give too much of it to small-combed breeds, birds with large combs naturally require a good supply in their dietary. Should white lobes become blushed or streaked with red, house the birds in warm but dark compartments, sponging the lobes daily with warm milk, afterwards drying them with a towel and dusting them with powdered zinc. Where a red lobe becomes streaked with white place the bird in a well-lighted house and provide it with plenty of scratching exercise.

Delicately-plumaged birds require ample shade from the sun. For this reason the exhibitor must take care of his young stock when they are getting their new plumage, especially if they are required for show purposes. Canvas screens can be fitted to houses both during the growing and moulting periods.

When Chickens Ail.—Chickens are not prone to many ailments, despite the fact that many rearers have a heavy percentage of mortality amongst the young stock. In the majority of cases the bad mating and ill-feeding of the parent stock are to be blamed. Given a sound *hatchable* egg, a *rearable* chick should be the result; if weakly-fertilised eggs or those from poorly-fed stock are used, mortality will naturally be heavy amongst the chickens. Many deaths, too, are caused by the rearer's negligence.

Colds.—Draughty structures cause colds, as do over-heated chambers. Remove the invalids, taking them into the house. A little tincture of quinine well diluted with water will prove a cure.

Cramp.—Leg-troubles are usually caused through over-heated chambers or through the chicks running on sparsely-littered boarded floors. Cramp is a muscular or rheumatic complaint which causes the bird to sit down helplessly, its toes being turned in and clutched together. Rub the legs of the invalid with a good embrocation and add litter to the floors.

Diarrhœa.—Thousands of chicks die yearly through this complaint, set up by a chill or irritation of the intestines. It invariably attacks weakly chicks, and if neglected deaths will be numerous. The droppings will be noticed blocking up the vent. Bathe the latter with warm water and rub thereon a little vaseline after cutting off the fluff around the part. Keep an eye on such ailing chicks and repeat the process when deemed necessary. Give the chicks a little olive oil in the soft food—teaspoonful of oil to four ounces of food—and add also a little powdered charcoal therein. The latter is a good stomach correcter for chickens, and a supply can be kept before the chicks in a shallow tin, nailed up on a wall a little off the ground and next the grit tin.

Gapes.—The gapeworm or "forked" worm gives great trouble to chicks, lodging in the trachea of the chicken. About an inch in length, it resembles in shape the letter Y, the larger portion being the

male and the smaller one the female. Chickens suffering from gapes will stand and gape for breath, and they should be isolated at once, as the ailment will be caught by other chicks through the drinking water, etc. A good plan is to place the chick in a box and blow smoke therein from a pipe of tobacco, taking care not to stifle the bird. This will cause the chick to throw up the gapeworms, which breed in large numbers if left undisturbed. Another method is to take a feather and strip off the fluff and web from the quill, leaving only a little at the top. Dip this in turpentine, insert in the chick's trachea, give several turns, and withdraw it when the gapeworms will be found clinging thereon. Repeat the operation, but take care to insert the feather in the *trachea* and not, as nine out of ten do, down the *crop*. The opening to the trachea is a small aperture at the base of the tongue. By moving the chick's tongue to one side this opening will be seen. Wait till the chick takes an inspiration, and then insert the feather into the trachea whilst it is open. It must be done quickly, as the trachea closes on being touched.

Leg-weakness.—This is caused by incorrect feeding—the lack of bone-forming foods, and an excess of soft-food. It is not a muscular complaint like cramp, as although the bird sits down and has not the strength to carry its own body-weight, cramped toes are not in evidence.

Parasites.—To keep chicks free from insects dust them occasionally with Izal powder. See that the hen is also well dusted both when sitting and with the chicks. If chicks droop their wings or feathers thoroughly examine them, especially on the head and neck, for insects, and rub a mixture of sulphur and lard on the affected parts. Izal powder is a good remedy for parasites.

CHAPTER VII

Feeding for Eggs.

Balancing a ration—Grains and their by-products—Popular green-foods—Value of animal foods—Little things that count—Dry-feeding in troughs—The soft mash—The evening grain—The food-house—Coppers and carriers—Troughs and hoppers—Automatic feeders.

WHEN egg-baskets are empty one usually finds the trouble is due to incorrect feeding. A good maxim to remember is: "If you want eggs feed for them." Before one can go into the question of feeding for egg-production the composition of the finished article must be considered.

	Water.	Ash.	Albumen.	Fat.
Egg	73·7	0·8	15·0	10·5
Carrot	88·0	1·0	1·0	0·4

I give here the analysis of a new-laid egg, and also that of a carrot for the sake of comparison. The first thing that strikes us is the fact that carrots contain plenty of water, but are miles behind in albumen. Water is essential for laying hens, but they can get this from the drinking fountain. In like manner we find that all foods are deficient in certain elements, and that is why the feeder has to mix his mashes and grains to approach the finished product he is striving for. It is in the balancing of his foods that the scientific feeder scores.

Constituents of Foods.—Poultry foods may be split up under six heads: (1) Water, (2) fibre, (3) ash, (4) albumen, (5) fats, (6) carbohydrates. An egg contains a very large percentage of *water*, hence the importance of this element. *Fibre* is found in the husk of the grain, etc., and although an excess is a waste, a certain amount is essential to make bulk and help the bowels act. Oats that are all husk and no grain are useless and wasteful. *Ash* represents the mineral matter in a food and is very necessary. Minerals assist growth, help form the egg-shells, and assist digestion. *Albumen* helps to make eggs, feather, blood, muscle, skin, bone, etc., and must be present in suitable proportion in all foods. Other names for albumen are: Nitrogen, protein, proteid, albuminoids, and flesh-formers. *Fats*

represent the oily portions of the food, and although performing similar duties as carbo-hydrates they are reckoned as $2\frac{1}{4}$ times more valuable as fuel. For this reason fats are multiplied by $2\frac{1}{4}$ to bring them to the level of carbo-hydrates when a ratio is being worked out. Fats are also called oils, hydro, and carbon. *Carbo-hydrates* represent heat and energy producers, such being composed of starch and sugars. The hen's body ranges in temperature from 102° to 110° F., and it is to the carbo-hydrates that she looks for fuel to keep her body-furnace going. She requires a little surplus store, too, but an excess results in her organs becoming fatty. Heat-producers, starch, sugar, etc., are other names for carbo-hydrates.

Balancing a Ration.—Before giving the analyses of the many well-known foods let us see how the scientific feeder goes to business. The laying hen, judged by the analyses of the egg and hen, requires a ration containing as nearly as possible 1 part of albumen to $4\frac{1}{2}$ parts of carbo-hydrates and fat. This is the proportion when the hen is in full lay, but at other times a wider ratio such as 1 to (or in) 6 or 1 to 7 would do. The scientific feeder, therefore, balances the foods he uses until he has a ratio for the complete daily menu of 1 to $4\frac{1}{2}$ or 1 to 5. The formula for ascertaining the ratio is—

$$\frac{(\text{Fats} \times 2\frac{1}{4}) + \text{Carbo-hydrates}}{\text{Albumen}}$$

Fats as previously explained are multiplied by $2\frac{1}{4}$ to bring them down to a level with the carbo-hydrates, as they are 2·25 times more valuable than the latter as fuel. To work out the albuminoid ratio of hempseed according to the above formula, we have—

$$\frac{\text{Fats } (21 \times 2\frac{1}{4}) + \text{carbo-hydrates } (45)}{\text{albumen } (10)} = \frac{47\frac{1}{4} + 45}{10} = \frac{92\frac{1}{4}}{10} = \frac{9}{1}$$

Thus we have the ratio as 1 of albumen to 9 of carbo-hydrates (*i.e.* 1 to 9), which is too wide, requiring other foods mixed with it to narrow down the albuminoid ratio. Where a number of grains are used, merely add up the totals of fats, carbo-hydrates, and albumen, and having multiplied the grand total of fats by $2\frac{1}{4}$, add the carbo-hydrates and divide the whole by the total of albumen as per the formula. The albuminoid ratio of a day's menu is arrived at the same way, by adding up the totals of all foods given—both grains and soft mash—and working the sum out as per the formula. Where 1 part of a food is used the analysis of that food stands as it is, but if 2 parts of a food is recommended multiply its analysis by 2, whereas if $\frac{1}{2}$ a part is used divide by 2, and so on. Where the ratio of each food is already known, the following little sum will give the combined ratio. Supposing you are advised to give 2 parts maize, 2 parts

oats, and 2 parts wheat, the combined ratio may be arrived at as follows :—

2 pts. maize	= 1 to 8 × 2 =	2 to 16
2 pts. oats	= 1 to 6 × 2 =	2 to 12
2 pts. wheat	= 1 to 6 × 2 =	2 to 12
	Total ..	6 to 40

The total represents 6 of albumen to 40 of carbo-hydrates, the albuminoid ratio being 1 to 6⅔.

Grains and their by-products.—When purchasing grain it is best to examine it carefully, being guided by its weight, colour, taste, and smell. Buy in quantities to save expense, and where several poultry-keepers club together so much the better. Never buy ready-mixed corn from the chandler; rather buy the grains separately and mix them up yourself.

Maize.—This grain is exceptionally high in carbo-hydrates or heat-producers, and must, therefore, be used with care. If given in excess fatty organs will result. It should be fed to laying hens about twice a week in the winter, being mixed with wheat and oats. As a cold-weather "change" grain maize has its good points. It should also be fed exclusively to broody hens whilst they are sitting. When cooked by steaming and flaking most of the oil is taken away and such maize-foods are good as a foundation to the soft mash or fed dry with other grains. Yellow maize will deepen the colour of the egg-yolk, and white-plumaged exhibition birds should have the white in preference to the yellow maize. Maize makes a capital fattening food for table chickens, although an excess is apt to turn the flesh yellow; it makes a bulky food when steamed in the boiler. It takes a long time to cook, perhaps, but it will be ready sooner if the grains are first partly crushed and then allowed to soak in water for a time before the copper fire is lit.

Barley.—In itself barley is not a popular grain, nor is it liked by the fowls; when sprouted it is made more valuable. Malt culms (or sprouts), brewer's grains, dried hops, and dried yeast are all by-products of barley, and excellent food-stuffs, being exceedingly rich in albuminoids and acting as aids to digestion. Barley-meal is very fattening, and should not be used extensively in the summer. In the winter or for fattening table chicks it is an excellent meal.

Buckwheat.—This is an excellent but neglected little grain. For winter use it certainly deserves attention.

Rye.—Like barley, this is not very popular nor appreciated by the fowls. When sprouted like oats, it is much better.

Rice.—This is fed extensively to Bantams to keep down their size. In cases of diarrhœa boiled rice, powdered with pulverised chalk, is a good corrective. Rice-meal is rich in albumen.

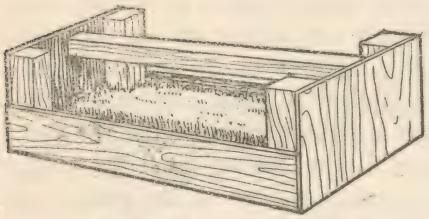
Beans and Peas.—These are very rich in albumen and make excellent "change" grains to provide the necessary *variety of feeding.*

Sunflower seeds.—These are very high in fats or oil, and so are excellent for fowls that are moulting, as is *linseed.* They are worthy of more consideration and each year in season all vacant spots should be given over to the growing of sunflowers.

Dari.—This is a good grain, and like other small grains, such as millet, hempseed, buckwheat, etc., promotes scratching exercise when scattered in litter.

Oats.—This is one of the most popular grains, and goes hand in hand with its sister—wheat. Light husky "rabbit" oats are useless; select heavy, plump samples, carrying large kernels. Where the oats are clipped there will be less fibre or husk. Pin-head oatmeal is excellent for young stock, as are Sussex ground oats—extensively used by raisers of table chickens. Both kernel and husk are ground up by specially prepared millstones. Hulled oats, which go also under the names "groats," "grits," etc., are excellent for young chickens.

Sprouted oats provide a cheap and most useful food. The sprouting of oats—and other grains—is very ingenious and has recently come into the limelight on account of the extensive use of sprouted oats for Intensive hens. The measurements of a sprouting box to take two pounds of dry oats should be about two feet long by one foot wide, and the depth several inches. The oats must be soaked in warm water for a day and then, after the water has been drained off, placed in the box to the depth of an inch. No soil is required, but in the bottom of the box a number of holes should be cut to carry off the water, as the oats have to be watered continually with luke-warm water. The grains must be regularly stirred until sprouting commences, when stirring must cease. The sprouted oats are ready for feeding when the sprouts are two or three inches high and the grass young and tender. Both roots and sprouts should be given to the fowls. It can be cut up finely for chicks. If possible, put the oats to sprout in a greenhouse or in a warm room, where the temperature registers about 60 degrees. Keep a number of sprouting boxes occupied, so as to keep up the supply of sprouted oats. A "cabinet" sprouter can be cheaply constructed. A lamp or heater is placed in the bottom, and above are placed a dozen or more shallow sprouting-boxes, each



OATS IN SPROUTING-BOX.

above the other and fitting into cabinetlike drawers. As regards the merits of this clever device, I may say that four pounds of dried oats sprouted in an ordinary green-house with a temperature a little above normal have been known to make a bulk when sprouted of over eighteen pounds.

Wheat.—There is not the least doubt that wheat is more extensively used for fowls than any other grain. Poultry never tire of wheat, and it is excellent for both growing and adult stock. Wheat screenings —small or crushed wheat screened before milling—make a good feed, provided the sample is up to the quality desired and does not contain an excess of husks and weed-seeds. Wheat forms the basis of many well-known grades of biscuit meal, which would account for its extensive use for poultry stock of all ages. Biscuit meal makes an excellent foundation food for mashes, and is improved by the addition therein of meat, which is the case now with many grades. Wheat bran is the outer and roughest part of the wheat berry, and the average buyer on the market knows its grades as flake, broad, fancy, straight, special, and stone-made. Sharps—in Yorkshire "shorts"—are between bran and middlings, the latter being layers of the wheat kernel after the outer coating or bran has been removed. Middlings usually include a little flour. In the process of manufacturing flour the offals pass through wire sieves. A sieve with twenty-two threads to the inch yields ordinary middlings, nineteen threads sharps, and sixteen threads bran. The products from wheat go under various names, according to the locality. Liverpool calls coarse middlings seconds, and sharps thirds. A mixture of coarse middling and bran is in certain localities called pollards. Other local names are toppings, thirds, blues, boxings, seconds, etc. Bran should be well scalded before use, and should find a place in all mashes. It is very cooling. Middlings are most useful to dry off the mash. Flaked wheat makes a good food for fowls, as does bread. If the latter is baked in the oven till brittle and afterwards pounded it will be found a good ingredient for mashes.

For the guidance of my readers I give the analyses of most of the popular grains and their by-products. It sometimes happens that the feeder wishes to compare the *food units* of two products, he is offered at the same price. To find out the food units the following *formula* must be followed :—

$$(\text{albumen} + \text{fat}) \times 2\tfrac{1}{2} + \text{carbo-hydrates}.$$

The food units of dried yeast, for instance, total 154, and this is arrived at by means of the formula as follows :—

$$(46 \text{ alb.} + 1\tfrac{1}{2} \text{ fat}) \times 2\tfrac{1}{2} + 35\tfrac{1}{2} = 154.$$

Grain or By-product.	Water.	Ash.	Albumen.	Fibre.	Carbo-hydrates.	Fat.	Albumin-oid ratio.
Barley	10·9	2·4	12·4	2·7	69·8	1·8	1 to 6
Barley Meal ..	11·9	2·6	10·5	6·5	66·3	2·2	1 to 6
Malt Culms ..	10·2	5·7	23·2	10·7	48·5	1·7	1 to 2
Dried Grains ..	—	—	32·7	—	37·2	10·7	1 to 1
Dried Hops ..	—	—	26·7	—	33·3	8·4	1 to 1
Dried Yeast ..	—	—	45·94	—	35·4	1·4	1 to ·8
Beans	13·5	3·0	25·5	10·0	46·5	1·5	1 to 2
Soy Beans ..	10·8	4·7	34·0	4·8	28·8	16·9	1 to 2
Buckwheat ..	12·6	2·0	10·0	8·7	64·5	2·2	1 to 7
,, Bran ..	10·5	3·1	12·4	31·9	38·8	3·3	1 to 4
,, Middlings ..	13·2	4·9	28·9	4·1	41·9	7·0	1 to 2
Cottonseed ..	10·2	3·5	18·4	23·2	24·7	19·9	1 to 4
Cottonseed meal	8·2	7·2	42·3	5·6	23·6	13·1	1 to 1
Decorticated cotton cake	—	—	43·78	—	23·56	11 38	1 to 1
Maize	10·6	1·5	10·3	2·2	70·4	5·0	1 to 8
Maize Meal ..	15·0	1·4	9·2	1·9	68·7	3·8	1 to 8
Pop Corn	10·7	1·5	11·6	1·8	69·2	5·2	1 to 7
Oats (whole or ground) ..	11·0	3·0	11·8	9·5	59·7	5·0	1 to 6
Oatmeal	7·9	2·0	14·7	0·2	67·4	7·1	1 to 5½
Rolled Oats ..	8·5	1·9	15·0	0·6	66·0	8·0	1 to 5½
Clipped Oats ..	11·2	2·8	12·0	7·4	61·6	5·0	1 to 6
Peas	14·0	2·6	20·2	14·4	51·1	1·2	1 to 2
Peameal	10·3	2·5	23·0	10·0	48·5	2·0	1 to 2
Rye	11·6	1·9	10·6	1·7	72·5	1·7	1 to 7
Millet	14·0	3·3	11·8	9·5	57·4	4·0	1 to 5½
Whole Wheat ..	10·5	1·8	11·9	1·8	71·9	2·7	1 to 6
Wheat Bran ..	11·9	5·8	11·4	9·0	53·9	4·0	1 to 4
,, Middlings	12·1	3·3	15·6	4·6	60·4	4·0	1 to 4
,, Screenings	11·6	2·9	12·5	4·9	65·1	3·0	1 to 5
Bread	31·2	—	6·9	—	44·2	0·9	1 to 6½
Biscuit meal ..	—	—	12·0	—	64·0	10·0	1 to 7
Dari	12·5	1·3	10·0	3·3	68·0	4·0	1 to 6
Hempseed ..	—	—	10·0	—	45·0	21·0	1 to 9
Kaffir Corn ..	—	—	11·81	—	67·75	4·0	1 to 6
Lentils	14·0	—	23·0	—	53·0	1·5	1 to 2
Linseed Meal ..	9·2	5·7	32·9	8·9	35·4	7·0	1 to 1½
Rice	11·4	0·4	7·6	0·2	79·2	0·4	1 to 10
Sorghum Seed ..	12·8	2·1	9·1	2·6	69·8	3·6	1 to 8½
Sunflower Seed ..	8·6	2·6	16·3	29·9	21·4	21·0	1 to 4

Popular Green Foods.—Green foods are essential for poultry stock, and can be given in their dry state or boiled and mixed in the mash.

Alfalfa.—In America this is a very popular food for most farm stock—cows, horses, pigs, poultry, etc. Its name covers that green food which we know better over here under the name of *lucerne.* It can be fed green or in the form of meal, the alfalfa in the former case being cut up into quarter- or half-inch lengths. It is a very rapid grower and soon ready to cut, for which reason most poultry-farmers in the United States reserve a proportion of their farm-ground for a crop of alfalfa.

Clover.—What alfalfa is to the American layer clover is to the British hen, although it is only in recent years that its merits have been recognised over here. It can be fed green or as a meal, and is excellent for winter eggs, growth in chicks, and fertile eggs. Before taking its place in the morning mash, clover-hay meal should be well scalded and allowed to bulk. There are many clover meals on the market, but avoid those that are full of weeds, thistles, etc. Clover hay meal is a very economical food if properly prepared by being placed in a bucket with a covering thereto and allowed to remain steaming for a good time.

Mangels, Swedes, etc.—For the winter, when greenstuffs are not to be had, such roots as swedes, mangel-wurzels, etc., should be used. When cut the green tops can be given to the hens and the roots buried in earthen beds till required. These roots can be boiled and used in the mash or given raw, being in the latter case cut in half and thrown to the fowls, who soon peck out the middle. Parsnips, turnips, carrots, apples, etc., are also excellent foods. Potatoes cannot boast of a good enough analysis to warrant their use to the extent they are at the present time. By all means use potatoes and potato parings in the mash, but not to excess.

Cabbage, etc.—Cabbage leaves and those of cauliflowers, brussel sprouts, brocoli, etc., are all widely used for fowls. The backyarder will place his greenstuff in a string bag and suspend this from the roof of his hen-run to within a foot or so of the ground, so that the birds can jump and take their food easily in fine strips. Brussel sprout stems should not be wasted, for if cut down the centre they provide occupation for the hens, who delight in picking out the centre portion. Lettuce is excellent for all poultry stock, especially chickens, acting as a medicine for the blood. Do not leave greenstuffs in the run to rot and smell; take out all stems and leaves not eaten up quickly.

Onions.—These are excellent for all stock, but must not be given in excess to laying hens, or their eggs will be ill-flavoured. All young growing stock should have onions (both raw and in their soft food) occasionally. Cut them up very finely. The tops also should be cut up and given to poultry of all ages. Like boiled stinging nettles, onions are good if only for their medicinal value.

A list of green-foods, etc., with analyses, is given below :—

Green Foods.	Water.	Ash.	Albumen.	Fibre.	Carbo-hydrates.	Fat.
Alfalfa (dry) ..	11·9	7·13	14·12	27·09	37·34	2·42
Alfalfa (green) ..	80·0	1·80	4·90	4·70	7·90	0·07
Artichokes	80·0	1·0	2·5	0·8	15·5	0·2
Beet pulp (dry) ..	8·0	5·4	9·5	15 4	61·3	0·4
Beet pulp (wet) ..	89·8	0·6	0·9	2·4	6·3	—
Cabbage	90·5	1·4	3·8	1·5	2·4	0·4
Carrots	88·6	1·0	1·1	1·3	7·6	0·4
Clover (dry).. ..	10·0	8·1	16·32	17·84	45·99	1·75
Clover (green) ..	70·8	2·1	4·4	8·1	13·5	1·1
Grass clippings (dry)	15·3	5·5	7·4	27·2	42·1	2·5
Grass clippings (green)	76·40	2·40	2·30	4·1	13·8	1·0
Green Oats	62·2	2·5	3·4	11·2	19·3	1·4
Lettuce	95·9	0·8	1·6	0·5	1·0	0·2
Mangel Wurzels ..	90·9	1·1	1·4	0·9	5·5	0·2
Onions	87·6	0·6	1·4	0·7	9·4	0·3
Onion tops	91·0	1·1	3·9	3·0	0·8	0·2
Potatoes	78·9	1·0	2·1	0·6	17·3	0·1
Turnips	90·5	0·8	1·1	1·2	6·2	0·2

Value of Animal Foods.—Animal foods, for the most part, are very rich in albumen, and for this reason fit in well with other ingredients of the mash that are short of albuminoid elements.

Meat-meal.—For heavy egg-production meat-meal is essential, but it should not be given in excess so as to have a detrimental effect on the organs of the hen. It is prepared by the raw meat being first cooked by steam pressure and the fat removed. The moisture is then taken away, leaving the finished article. Poultry stock of all ages benefit by having an occasional feed of meat-meal or meat scraps.

Meat scraps.—Meat scraps are excellent for all stock when given in a reasonable quantity. Butchers' offal can be had cheaply, and if fresh this makes a good food when cleaned and boiled. Meat scraps take the place of insects, grubs, etc., and are therefore valuable for fowls kept in confinement. A little meat will cure diarrhœa.

Fish-meal.—This is on a level with meat-meal, and is a wonderful food for heavy egg-production. In many samples the oil has been removed to a certain degree and thus the flavour of the eggs is not so readily affected. It is customary to allow this food to represent one-tenth of the mash of which it is an ingredient.

Milk.—Whether fresh or skimmed, milk is appreciated by the fowls. It can be given to drink in place of water or used to moisten the mash. For young stock milk is admirable, and one well-known lady-fancier gives milk to all the fowls on the farm, using earthenware receptacles.

Green bone.—Fresh bones ground in a bone-cutter yield green bone, which, however, is not "green" in colour. It is excellent for egg-production, but must be given fresh and not in excess. It is unwise to give it to breeding stock where strongly-fertilised eggs are the objective, although a wee bit will do no harm.

Bone-meal.—This is obtained by grinding dry bones to a meal, and for egg-production it is excellent. It aids growth in young chickens, which should have it in reasonable quantities in their soft food to build them up all the time they are growing.

Below is given a table of animal foods with analyses :—

Animal Foods.	Water.	Ash.	Albumen.	Fibre.	Carbo-hydrates.	Fat.
Buttermilk	90·1	0·7	4·0	—	4·0	1·2
Cheese	40·6	3·4	23·7	—	1·7	30·6
Fish scrap (varies) ..	5—10	2—8	34—50	—	—	17
Fresh Fish	44·0	1·0	10·5	42	—	2·50
Green Cut Bone ..	38·94	26·12	20·37	—	—	11·67
Ground Bone (dry) ..	8·19	59·95	31·36	—	—	3·50
Horseflesh	74·3	1·4	21·7	—	—	2·6
Meat scraps (high grade)	10·70	4·10	60·2	—	—	25
Meat scraps (low grade)	15·40	2·50	45·0	—	—	37·1
Milk	87·2	0·6	3·6	—	4·9	3·7
Pork scrap	11·0	2·2	55·0	—	—	31·8
Skimmed Milk	90·6	0·7	3·1	—	5·3	0·3

Little Things that Count.—*Salt* is essential, one tablespoonful for one hundred birds being the dose ; dissolve it in the water used to moisten the mash. A teaspoonful of *mustard* for each dozen fowls, given in the mash two or three times a week in cold weather, will aid digestion and egg-production. Powdered *charcoal* purifies the system and can be fed dry in feeding hoppers or a little mixed with the mash. Drinking *water* is essential, and it should be always fresh. Self-filling drinking fountains are cheap and make the best vessels ; to clean them place a handful of small shot inside, add a little water, and well shake. *Grit* and *oyster-shell* are essential for hens, and the sharper the former the better. Grit is for grinding the food, and the shell for forming the egg-shells.

Feeding Intensive Hens.—The Intensive system has been an eye-opener as regards feeding. The houses are bedded down with litter, in which the grain is well raked to promote exercise. The following is a common menu card :—*Summer* : 8 a.m., grain ; 10 a.m., sprouted oats ; noon, wet mash ; 5 o'clock, grain. *Winter* : Early morning, wet mash followed by grain, sprouted oats, and grain the last thing. The Intensivists have given us a surprise by adopting *dry mashes*, arguing that wet mashes cause the hens to be lazy. The meals are

given in their dry state in hoppers, some allowing the receptacles to be open all day long and others only opening them in the afternoon. Many keep dry bran in hoppers always before the fowls, whilst not a few feed their last meal of grain in troughs to allow the birds to have a quiet meal before going to bed. There is no end to feeding systems, and plenty of room for official tests. The menu for five hundred birds on the Rancocas Intensive Farm, New Jersey, is :—

8 lbs. bran.
7 lbs. middlings.
7 lbs. ground oats and maize.
4 lbs. beef suet.
5 lbs. clover (finely chopped).
½ lb. oyster shell (fine).
3½ lbs. linseed meal.

The clover is scalded and the whole mixed to a crumbly state with water. The mash—one oz. per bird—is fed at 7 a.m., a scratch feed of 7½ lbs. hulled oats and 7½ lbs. barley—½ oz. each hen—being given at 9 a.m., and a green-feed—30 lbs. to 500 hens—at 11 o'clock. At noon a scratch feed equal to that of the morning is given, and in the evening 50 lbs. of wheat and cracked maize. This last meal is placed in troughs, so that the hens can feed without any exertion.

Dry-Feeding in Troughs.—When the mammoth Intensive houses began to move poultry-keepers saw a way of saving time and labour in feeding by giving the ingredients of the soft mash *dry* in hoppers. All the hen had to do was to run up to the self-feeding hoppers (drinking fountain principle) and sample the meals, taking the tit-bits she fancied and so balancing her own rations. In America the dry-feeding of the mash is practised extensively, and we could certainly do with tests and data over here. The hoppers are usually left open all day, but should the hens show a tendency to get over-fat the receptacles are only opened in the afternoon for a couple of hours. That there is something in the new system of feeding, I have not the least doubt. "Lady Cornell," that little White Leghorn hen of the Cornell University Experiment Station (U.S.A.) laid 257 eggs in her pullet year on a dry mash. The following mash was fed—winter and summer—dry in a hopper, which was kept open in the afternoon only, the ingredients being used in the proportions mentioned :—

	lbs.		lbs.
Maize meal	60	Oil meal	10
Wheat middlings ..	60	Beef scrap	50
„ bran	30	Salt	1
Alfalfa meal	10		

Wheat, maize, and oats (with buckwheat added in the winter) were scattered in the litter morning and evening. Two other well-known "dry" mashes I give below for the guidance of readers. The first is fed on the Massachusetts College Experiment Farm, whilst the latter was used in the Laying Contest at Storrs, Connecticut, when

English White Leghorns sent from Lancashire brought home the first prize :—

1.	Parts.
Wheat bran	1
Wheat middlings.. ..	1
Maize-meal	1
Ground oats (fine) ..	1
Alfalfa meal	1
Beef scrap..	1

2.	lbs.
Coarse bran	200
Maize meal	100
Gluten feed	100
Ground oats	100
Middlings	75
Low grade flour ..	25
Fish scrap	30
Beef scrap	30

Some poultry-keepers, too, give the grain in troughs, but for *laying hens* this method cannot beat the old one of scattering grain in the litter. For *young stock* many keep a trough of grain always before them, and this would seem practical. There are many, too, who leave a hopper of dry bran always before the fowls—young or adult. Bran helps in the digestion of other foods and gives the gizzard some active work, which is food for it.

For a long time I advocated the use of *dry*-mashes, but interest therein in any marked degree was not then shown. Now, however, many well-known utility breeders have adopted the new system of feeding, one of our most successful, Mr. Collinson, feeding all his stock this way. I have always thought very highly of the *dry-mash* system, and recommend readers to make exhaustive experiments with the same.

The Soft Mash.—As regards the amount of food a hen requires per day, this will depend upon the breed—whether heavy or light—and also its environment. Generally speaking, two ounces of mash per bird is advisable in the morning, and two ounces of corn at night, and green-food at mid-day. If meat or green bone is given at mid-day half an ounce per head is to be recommended. If too much soft food is given the hens are apt to get too fat. Examine the birds regularly when they are at roost and reduce the soft food and give Epsom Salts, if they are over-fat. Warm mashes are apt to cause the hens to mope about after they have finished the meal. If this happens, give less of the soft food and follow with a handful or two of grain scattered in the litter. The morning mash should be given very early, so that the hens do not have to wait about on empty stomachs. Hens are early-risers, too, remember. In the winter the ingredients of the soft mash should contain more albumen and heat-producing elements than in the summer. In the summer insect life is plentiful and this must be arranged for where the fowls are on free range. Give the mash warm in the winter and cold in the summer.

On the farm.—In the summer fowls on the farm with free range will get plenty of animal food in the nature of grubs, insects, etc., which must be allowed for by working to a ratio of 1 in 6. Two meals

per day in the summer will be all that fowls on free range require, the morning mash being dispensed with. The morning and evening foods in such cases can consist of grain. Fowls that are semi-confined, *i.e.* only have a limited grass run, can in the summer have soft food on, say every other morning, grain being given on other mornings. In the winter clover-hay meal, fish-meal, meat-meal, and occasionally boiled maize may be included in the mash, the poultry-keeper ringing the changes on them. The following are given as examples of what the ingredients of the mash for winter use may be for fowls on free range :—

	Parts.			Parts.
Bran	2		Bran	2
Clover hay meal	1	or	Middlings	4
Middlings	4		Biscuit meal	2
Biscuit meal	2		Fish or meat-meal ..	1

Swedes, mangels, etc.—green-food—can be given at mid-day in the winter when clover-hay meal is not in the morning mash, and a little meat can be given at noon on days when fish or meat-meal is omitted from the mash. Occasionally a handful or so of grains can be scattered at noon in the litter. There is nothing like variety so long as the change is not too sudden, as it were. Breeding stock must not be forced if fertile eggs are the objective ; they must be kept racy and fit.

In the backyard.—In the summer, backyard hens must not be fed on too heating a diet. Keep the fowls active, and during the very warm weather only give soft food every other morning, and grain on others. Give the mash cold. Give the hens plenty of green-food at mid-day, for if hens do not have sufficient greenstuff the egg-yolks will be pale in colour. Keep grit and clean water always before the fowls. Warm the drinking water in the winter so that the fowls do not run to cold water after their hot breakfast and so get chilled. Give the morning mash early in the winter ; do not let the hens run about in the cold on empty stomachs. In the winter give swedes or mangels at mid-day occasionally, and clover-hay meal in the soft food, as confined fowls require green foods in the winter as much as in the summer. Below I give two suitable mashes for backyard fowls—for summer and winter use respectively :—

Summer.	Parts.	*Winter.*	Parts.
Bran	1	Bran	1
Middlings	2	Middlings	2
House scraps	1	Clover-hay meal ..	½
Cooked vegetables ..	2	Meat scraps or fish-meal	½
		Cooked vegetables ..	2

Bran, fish-meal, and biscuit-meal should always be well scalded before use, and middlings should be the ingredient used to dry the mash off. Soft food should be fed in troughs, and in a dry, crumbly

state—never wet and sloppy. In the winter backyard hens will appreciate biscuit meal in the mash. Occasionally, as a change, the soft food can be given at night with grain in the morning.

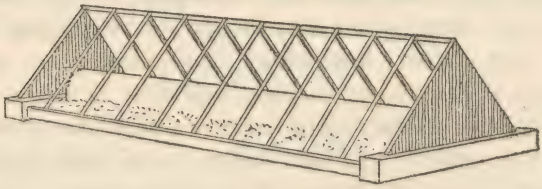
The Evening Grain.—Grain should always be scattered in the litter, this procedure promoting healthy exercise. All soil or litter in runs should be kept soft for that purpose. Wheat and oats make the best staple grains, although maize is useful for winter use. Other grains for cold weather are hempseed, sunflower seed, cotton-seed, soy beans, buckwheat, etc. Small seeds are handy for scattering in the litter, and include dari, millet, buckwheat, hempseed, peas, rice, etc. In the winter boil the corn occasionally and give it warm. As another change, merely pour boiling water over it and allow to stand. When the water is luke-warm, take the bucket round and dipping the hand into the water, throw the heated grain to the birds. Provide plenty of variety in grain-feeding, ringing the changes on wheat and oats especially, sometimes giving them separately, sometimes together, and at others mixed with any of the above-mentioned grains.

The Food House.—A food house is essential on the poultry-farm and is handy also in a backyard. As a rule, an ordinary out-house can be turned into use, but occasionally a special structure has to be erected. The size of the building must depend upon the number of birds kept and the amount of food stored. It naturally pays to buy foods in quantities when the market is easy, but this procedure is only possible where accommodation is sufficient. If a long out-house can be requisitioned, use one half for the corn bins and appliances, and the other half for the food. A two-storeyed house is best, the food being stored on the top floor and passed down chutes into the various bins below on the bottom floor, where, too, the feeding appliances will be kept. Wooden bins or wooden tubs (lined inside with tin) or specially-made galvanized bins are necessary for the various meals and grains. Tar the bins half-way up to keep rats or mice away. Keep the covers always closed in order not to encourage rats or mice, and for the same reason never leave any food about. The location of the house must be studied, as the nearer to the fowls the structure is, the greater the save in labour.

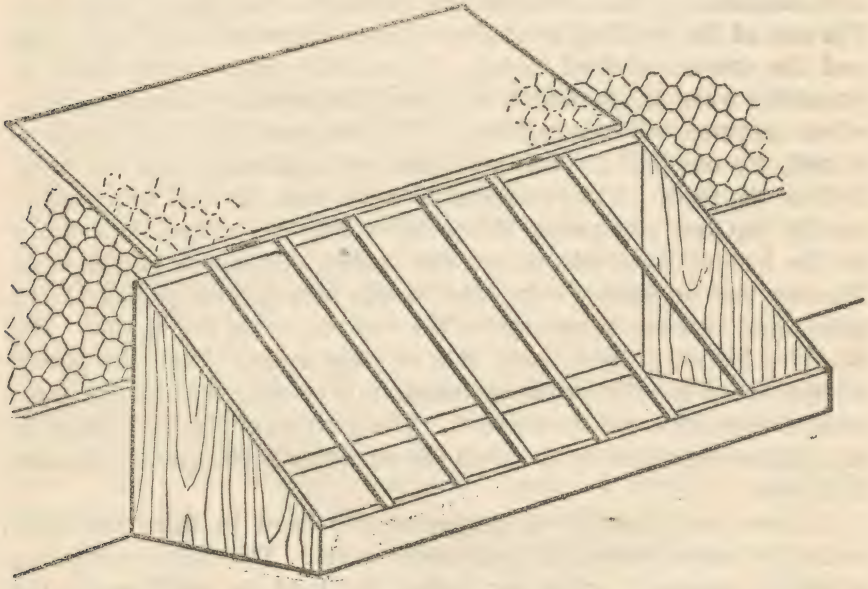
Coppers and Carriers.—A copper or two must be fitted up either inside the house or near at hand under cover. The copper will prove a boon in scores of ways, for boiling the food in, scalding out the troughs and drinking vessels, etc. There are scores of different designs on the market, and postcards to the numerous appliance firms will bring a host of most useful illustrated trade catalogues—free. Food carriers are essential, and these again are made in many designs. A few well-built wheelbarrows are always handy on the farm, and when taking round the warm morning mash cover a heavy sack over

the food in the barrow to keep it warm. A mixing bath or bin should have a place in the feed house, as should such things as bone-cutters, hurricane lamps, spare aprons, lengths of string, knife, scissors, large packing needles, and a hundred and one other useful things, the object being to save a lot of trips down to the farmhouse.

Feeding Troughs and Hoppers.—All soft mashes should be fed in troughs, as cleanliness in feeding spells success. There are many



designs of troughs on the market, and any one handy with tools can make a V-shaped food-trough, nailing a support at either end. The accompanying sketch is of a useful trough with narrow spars on either side, through which the fowls can thrust their heads for the food



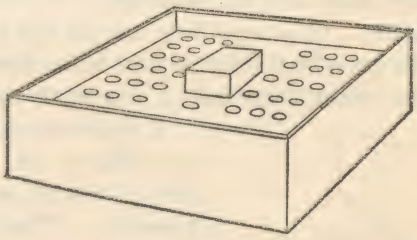
inside. Many use pieces of ordinary water-spouting. Whatever are used, see that they are regularly scalded out. If the soft food is thrown down on the grass the latter soon gets worn out, and it would be courting failure to throw soft food on earthen backyard runs. Where possible, make the troughs to hang up out of the way when not in use.

I also give a sketch of a trough that can be cheaply fitted to the

wire-netting front of any backyard run. On the inside there are spars, through which the fowls thrust their heads. The soft food is placed on the platform without going into the run, the door being on the outside of the run. The drinking water and grit receptacles can also be placed on the platform, while the size of the appliance will depend upon the number of birds to be fed.

We next come to food-hoppers, which are used in connection with dry-feeding, as previously touched upon. There are scores of shapes and sizes on the market, the one to use being that which prevents the fowls from routing the food out of the receptacle on to the floor and so wasting it. The principle of these appliances is after the nature of that of the self-filling fountain. The food is placed in the top of the receptacle and as the fowls devour that in the cups below more falls down from the body of the hopper to replace it. Smaller sizes can be used as receptacles for grit, charcoal, bran, etc., so that the fowls can always have a supply before them. A lid covers the top of the hopper and hinged covers can be fitted over the cups to prevent the fowls from getting the food, if so desired, for a part of the day.

The accompanying sketch is of a novel hopper. It consists of an ordinary box, which is filled with dry mash (or corn). A heavy piece of wood just smaller than the box itself is dropped on the food and a brick placed thereon to keep the wood down. Holes are bored in the wood, and it is through these that the fowls take their feed. The box can be placed on the ground and the size of the box or hopper will depend upon the number of fowls to be fed. There can be no waste with such an appliance.



If the *dry-mash* system of feeding is to be a success, a properly-designed hopper is essential. The ideal hopper is one where there is no wastage through the fowls throwing out the food into the litter with their beaks. A very clever hopper is that designed by my friend Mr. J. H. Burn-Murdoch of Great Shelford, Cambs—well-known in utility Black Leghorn circles. This pattern was designed not only to prevent wastage but also to save labour, each appliance holding several weeks' supply of food. In a few moments, too, each hopper can be adjusted to feed any size of bird from a day-old to the largest cockerel. Another of this breeder's patents is an automatic font which when once filled will look after a hundred fowls for from ten to twenty days. Yet the device can be thoroughly cleaned in less than five

seconds. These automatic feeding and drinking appliances must prove a boon to poultry-farmers, enabling them to cut down cost of labour to a minimum.

Automatic Feeding Appliances.—We live in an age when the saving of labour means a lot. That is why the labour-saving automatic feeders deserve support. Self-feeding appliances to hold corn have come to the front of late, and one I have in mind is made in all sizes for poultry of all ages. The hopper or body is filled with grain, and when the fowls peck at the corn in the bait-receptacle below the feeder automatically scatters a sprinkling of corn in the litter below. The fowls—even baby chicks—soon discover how to work this machine. It stands on legs and can be placed out in the field, in the Intensive house, or backyard run and takes up little space. There is another self-feeder, which not only feeds grain at certain hours, but also supplies a constant supply of drinking water. It is a clever invention, and for it we have to thank a lady poultry-keeper. The grain is placed in cups round the side of a can holding water. On the top of the water floats a heavy cork. The water continues to drip, drip, drip, by a special arrangement, and as the water in the can sinks down follows the cork and tips the grain tins one by one. The escape of the water has been planned so that the cans drop every half hour. Any cans can be left empty, so that even when they tip no food is given. Thus by filling one of the lower tins we know that the fowls will get a feed three or four hours from filling the centre can with water. The latter drips into a receptacle and the fowls drink it.

A home-made grain feeder can be made out of an ordinary tin. The grain is placed in the tin, the lid put on, and the whole hung up to the roof of the run. The tin thus swings nearly to the floor. Around the tin at the bottom medium-sized holes are made through which the grain shows. When the hen feels hungry she has merely to peck at the corn that shows, and it drops into the litter beneath and is replaced by further grains that slip down.

Self-feeders are handy, as it sometimes happens that a man goes to work in the morning after giving the fowls a good warm breakfast and does not arrive home in the winter till it is dark. An automatic feeder to such a person should prove a boon. Many clever automatic feeders have I seen, one, among others, where by fastening a piece of string to the alarum-winder at the back of an alarm clock and then to the sliding bottom of a receptacle holding food, the latter was released when the alarum went off at a stated time, the turning of the key tightening the string and doing the trick. The alarm could be set for

four o'clock and the owner would know that the fowls would get their evening feed.

The Hay-box.—Backyard poultry-keepers should keep a stock pot into which all scraps, etc., can be placed. When the fire is not being used for any special purpose on can go the stock pot. The "hay-box," also, should prove a boon to poultry-keepers. It consists of an ordinary Tate sugar-box, around the inside of which newspapers are tightly pressed. The corners are next well packed with hay, a quantity of the latter being placed over the newspaper at the bottom of the box. The saucepan or stock pot containing the food for the morning is placed on the fire till the contents boil, when it is placed in the hay-box and covered with two thick hay-stuffed cushions. In the morning the food will still be warm and ready for use. Receptacles with the handle over the top and made to drop are best to put in the hay-box.

CHAPTER VIII

Breeding for Eggs and Feather.

Number of hens per male—Duration of male's influence—Care of the breeders—Line-breeding—Introducing fresh blood—The male—The female—The 300-egg hen—Trap-nesting laying stock—Single v. double-mating—Danger from in-breeding—Male and female lines.

IF you want eggs you must *breed* for them quite as much as you must *feed* for them. One of the first questions the novice asks is, "Which is the best *breed* for egg-production?" and some authorities take up pen and paper and name such-and-such a breed instead of going deeply into the query raised. There is no best *breed* for eggs as everything depends upon *strain!* If I advised you to-day to try Buttercups as the best layers, you might write me a year hence and say you never had such bad layers. Yet there would be nothing wrong with the breed! The fact is there are good and bad laying strains in all breeds, which is the reason for many objections to some of the best laying varieties. Obtain, therefore, a good laying strain in the breed selected if you want plenty of eggs, and take pains to secure a strain noted for *good-sized* eggs. Having done this, go on improving the strain. Should you get into a bad strain don't write to the Poultry Press immediately and say what an absolute failure such-and-such a breed is, but—try another strain.

Number of Hens per Male.—In selecting the stock birds see that they are healthy and well-matured. Age should be on one side, for which reason it is customary to mate (1) cocks to pullets, and (2) cockerels to hens. The latter method undoubtedly gives the best results, and utility poultry-keepers out for heavy egg-production will do well to trap-nest their layers in their first or pullet year and breed from the best of them in their second or hen year. It is hard to say just how many hens should be mated to the male, as so much depends upon the bird's vigour and the season of the year. During the early part of the year four or five "heavy" females can be mated to the head of the pen, more being added as time goes on, until eight will not be too many when the breeding season proper is reached. In light varieties use five or six females early and increase to eight or nine.

Over-mating is as harmful as under-mating, and the best guide is by the feathers at the shoulder of the wings and on the back. If these are undisturbed over-mating may be suspected, and if very much ruffled and broken, under-mating. It is advisable to examine the hens in this way, for occasionally a male bird will take to a certain hen and neglect the others. That female will be very bare at the shoulders and should be removed from the pen, or unfertile eggs will be the result. If, too, the male is spiteful to any hens, pecking them at feeding, remove such birds, as they only disturb the peace of the pen. As a rule, it will be found that such hens are not "in lay," and refuse the male's attentions. *Moral*: Only mate up females that are in lay or on the point of laying.

The Male's Influence.—"How soon after mating up the pens can the eggs be relied on for fertility?" is a very common query during the breeding season. It is erroneous to think, as many do, that the male fertilises an egg the same day it is laid, for that egg has already been fully-shelled many hours before dropping into the nest. The male at one alliance fertilises a clutch of eggs, running, say, into double figures, and although some breeders take the risk of sitting or selling eggs laid from three to seven days after mating, a greater percentage of *fertiles* will result if from twelve to fourteen days are allowed to pass before eggs are used. Mate up the breeding pens, therefore, at least a fortnight before eggs are required. Male birds give trouble, as do females, during the breeding season, by flying over into the next pen. Such hens are not "lined," as some people imagine, but the batch of eggs under development at the time of the alliance will be crossed. Do not use any eggs for sitting from birds so crossed until a fortnight has elapsed. Make a point of catching any such hens and keep them separate till all is well. Where a customer gets a cross-chicken in his brood he will only be disappointed and blame the vendor's hybrid stock, not knowing what has happened. Therefore, if only for future trade's sake, take no chances. The wise poultry-farmer will carry a pair of scissors always on him and clip the primary or flight feathers of one wing near the roots of any birds that are noticed in their wrong pens. Take every precaution against such harmful crossing by closing all gates, and keeping all wire-netting repaired during the breeding season. A good plan is to quarter the several pens of the same variety next to one another so that if any hens fly over they will not be "crossed." Supposing there are three pens of Rhode Island Reds in one alley, place three other pens in the next alley, the runs to meet in the centre. Buff and red breeds can follow each other, also white varieties, etc., so that if a Buff Rock get into the Rhode Island Red pen and flies back again unnoticed, any purchaser of her eggs will get a decent coloured bird and not a "piebald," as would happen

if Black Leghorn followed White Leghorn pens. If necessary, a pen can be left empty between each breed during the breeding season and given over to young chicks. One can ascertain which pens these "roamers" come from by glancing at the colour of their leg-bands.

Care of the Breeders.—Take every care of the parent stock. It is absurd to allow the males to run with the hens all the year round. If this happens, how can they be expected to fertilise eggs? Directly the breeding season is over break up the pens and separate the sexes, as already recommended. Before breaking up the pens put a distinguishing mark on each male's left leg to say if he has earned the V.C. as a breeder, so that the right birds will be sold when the time for their disposal comes round. Do not disturb breeding stock, and go in the runs as little as possible; never frighten the birds. Do not use too old nor yet too young stock, and avoid spiteful males that *harass the hens*, although those males that are *spiteful to their owners* somehow or other turn out the best breeders. Occasionally give the breeding birds a few tit-bits from the hand and feed those gallant males that allow their consorts all by themselves, shutting up the hens meanwhile. Never spoil an exhibition youngster by "over-showing" or exhibiting it before it has fully matured. Breeders and winners should be kept for their respective purposes. Once the pens have been mated up do not take the male bird away for exhibition purposes. As the hens go broody and are given eggs, bring up the reserves, but the main object of the poultry-farmer should be to cure his *breeding* hens of broodiness at once, to avoid disarranging matters in the pens. Any newcomers should be placed in the sleeping house (*i.e.* on the perch at night), so that the other fowls do not notice their arrival, and make friends more quickly and without bloodshed in the morning.

Single *v.* Double-mating.—Where exhibition specimens of both sexes can be bred from one and the same pen, this is called single-mating. Where it is necessary to mate up one pen to breed exhibition cockerels, and another to obtain exhibition pullets of the same variety, this is termed double-mating. Two pens are therefore necessary for the latter. *Pullet-breeding*: Here the females will be all tip-top exhibition specimens, and at their head will be a male that is not a *show* bird, but possesses characteristics that tell the owner he will breed tip-top pullets. The cockerels bred from such a mating will be very inferior and useless for show, being, of course, useful only as pullet-breeders. *Cockerel-breeding*: The male bird will be a tip-top exhibition specimen, and his consorts females that are most likely by their markings and characteristics to breed *show* cockerels. The pullets so bred will make cockerel-breeders. Where the breeder has not the room for two pens, he usually takes up one line of breeding—cockerels or pullets—being content to win prizes with the one sex. It is in laced,

pencilled, etc., breeds where the plumage in the two sexes is differently coloured, that double-mating is practised, not with self-coloured birds. In some varieties—Minorcas, Andalusians, Leghorns, etc.—the male's comb has to be upright, whereas the pullet's must fall over. Double-mating is practised to breed such headgear. A cockerel with a comb that falls over—but not through physical weakness—is mated up to breed pullets ; pullets with erect combs are used to breed cockerels.

The Male.—The male, as the head of the pen, is naturally an important member. The choice of males will, of course, depend upon the object to be achieved.

Utility.—In breeding for heavy egg-production the sire is quite as important, if not more so, as the females. Years of pedigree breeding would be ruined in a season were an inferior-bred male used. *When breeding for eggs see that the males are from heavy-laying mothers.* Do not grumble at having to pay a good price for a male bird, as the money will be repaid a hundred-fold. To improve the colour of the eggs, use males hatched from rich-coloured brown eggs, as previously recommended.

Fancy.—The colour of the head of the pen is invariably handed down to the progeny, so never use bad-coloured birds. Other points that the progeny take from the male include eye-colour, headpoints, ground colour (in laced, pencilled, or barred breeds), etc. *Like begets like* is a well-known axiom in breeding poultry. Never trust to haphazard matings, and always correct the faults of one parent by the excellences in those very points in the other sex. It would naturally be courting disaster to mate together two birds having the same glaring fault.

The Female.—The female, too, has to possess merits all her very own whether the poultry-keeper is breeding for eggs or for feather.

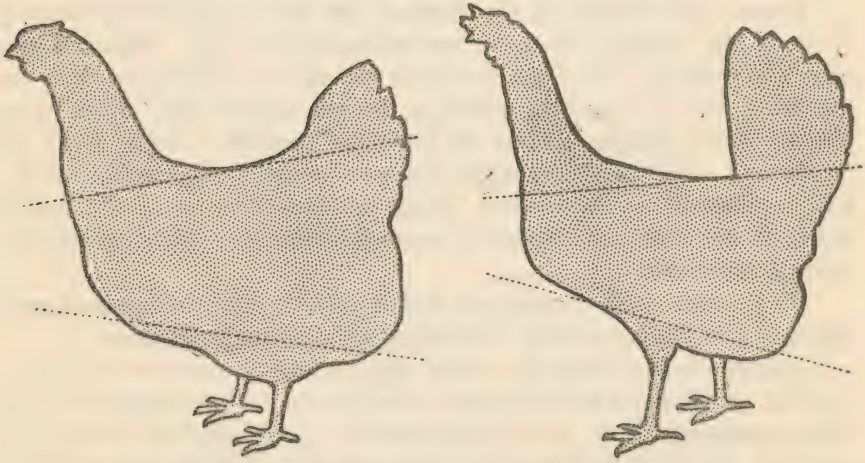
Utility.—In breeding for heavy egg-production one must be continually breeding on definite lines, selecting for certain characteristics and improving them as he goes along. Line-breeding should be practised, also trap-nesting, and an eye should be kept on those females that (1) lay large eggs ; (2) yield plenty of winter eggs ; (3) lay rich-coloured eggs ; (4) come on to lay to time as pullets ; (5) give little trouble from broodiness ; (6) rise early and retire late, and (7) are always on the move.

Fancy.—It is to the female that the exhibition breeder looks for such points as size, type, barring, lacing, pencilling, or spangling, etc. Never breed from small hens if size is a *sine qua non* in the breed.

The Laying Type.—There is no more certain method of telling which are the best layers than trap-nesting. One can, however, pick out a layer if guided by a few elementary rules. *The laying-type of hen* has a short, fine head, a keen, intelligent eye, a long, snakey

neck, and a rather small frame. Her body is long and cone-shaped, pelvis broad, and abdomen large and pendulous, and well covered with an abundance of fluffy feathers. When a hen is in lay two fingers can be placed in the space between the two cheek bones of the abdomen; these bones close when the bird is not laying. The test will be useful where "laying" birds are being purchased. The best layers invariably have high tails and large combs, whilst they are wedge-shaped—rather narrow in front, but wide behind and between the legs. Below I give the types of White Wyandottes and White Leghorns that proved prolific during a recent twelve months' Laying Competition of the Utility Poultry Club. The winning pen of White Wyandottes consisting of six birds, laid 1389 eggs during the twelve months. The dotted lines in each sketch show the wedge-shape, the heavy development being towards the rear.

The Laying-type of Hen.



WHITE WYANDOTTE. WHITE LEGHORN.

The 300-egg Hen.—Not many years ago one would have been dumbfounded had he read of a hen laying 200 eggs in twelve months. Remarkable indeed have been the strides made by the little domestic hen and, what is more, she is still climbing higher up the ladder. Breeders used to try for the 150-eggs-per-year mark, next 200, then 250, and—well, 300 eggs will soon be "fixed" I am sure. Two hens have already recorded 300 and 301 eggs respectively in twelve months, the 300-egger being Professor Jas. Dryden's famous little hen from the Oregon (U.S.A.) Experimental Station, whose four sisters in the same yard averaged 240 eggs, and one of whose relatives had previously

scored 291 eggs in the year. British hens are not behind, for one little Welsh hen I know of laid 301 eggs in twelve months. "May Queen"—a little White Leghorn pullet, laid 285 in the 1913–14 U.P.C. twelve months' Laying Contest at Harper Adams College, whilst in the same season a White Wyandotte pullet laid 284 eggs in the N.U.P.S. twelve months' test at Burnley. Again, "All-British" hens now hold the world's record for winter laying. The record was created in the 1914–15 Utility P.C.'s ten months' Laying Competition at Harper Adams College, Newport, Salop, by a pen of six White Wyandottes which laid 523 eggs in the four winter months—an average of over 87 eggs per bird. I give the scoring for the 112 days, as it is remarkable.

On 23 days	6	eggs	were	laid	by	the	six birds.
„ 42	„ 5	„		„		„	
„ 31	„ 4	„		„		„	
„ 15	„ 3	„		„		„	
„ 1	„ 2	„		„		„	

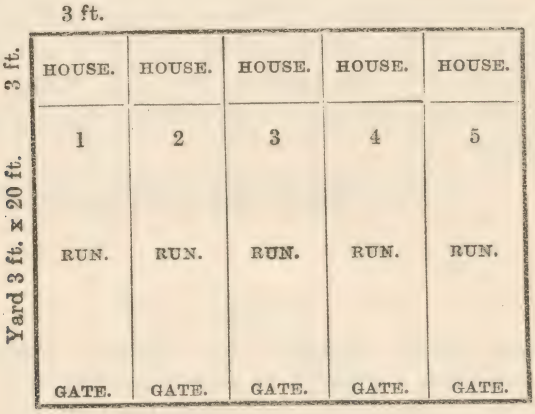
Other records include that of "Lady Cornell" with 457 eggs to her record in two years; 281 eggs in twelve months by a White Rock hen; 282 eggs by a Barred Rock at Guelph, Canada—this hen holding the world's record for many years; 969 eggs by a Leghorn hen in seven years, and 606 by a Braekel hen in four years. The average hen on the farm is a poor producer, and I doubt if some flocks average 100 eggs per head per year. This state of affairs must be altered, and I am sure the records given above will show what can be done by way of breeding (and feeding) to get heavy egg-yields. Trap-nesting and line-breeding are essential!

Trap-nesting the Laying Stock.—The trap-nest never tells a lie, and to breed heavy egg-producers the poultry-keeper must adopt (1) Line-breeding and (2) Trap-nesting. Many argue that they have no time to look after trap-nests, but that is idle talk. Whilst I would like to see *every hen* on every farm trap-nested, I might agree that for many such a thorough system could not be worked. *Every utility man can, however, trap-nest selected pullets during their first year of laying, and breed, in their second season, only from those with the best records, mating them to cockerels direct from mothers with heavy records.* The egg-production of the flock would soon be increased thereby beyond imagination. Some breeders I know never use a male unless its mother laid 200 or more eggs in her pullet year.

There are many designs of trap-nests on the market, but one that is not noisy in working and does not frighten the layer should be selected. The simpler the trap-nest the better. The hen goes on to the nest and automatically closes the door behind her. The owner must visit the trap-nests regularly, releasing any hens inside

them after recording their number, weight of each egg, etc., and re-setting the nests.

The selected pullets can be single-pen tested instead of being trap-nested. One long continuous house is built and divided by wire partitions into three-feet lengths. Runs are next added, the number depending upon the birds to be so housed. Each layer has a single

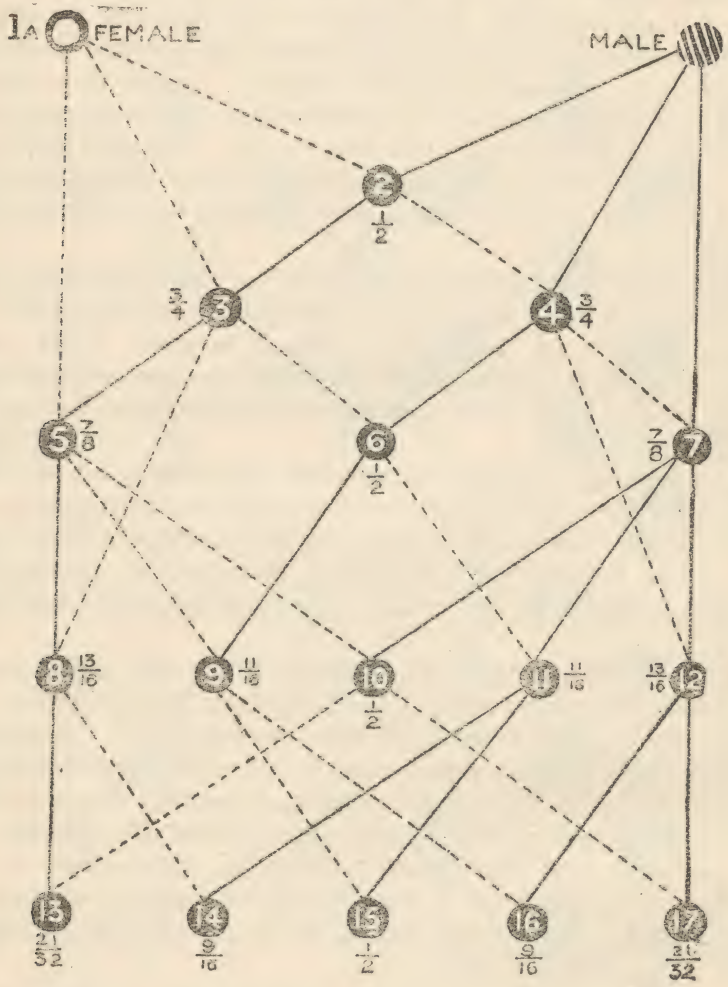


roosting and laying house 3 feet by 3 feet, and a run 20 feet by 3 feet. The occupants should wear different coloured or numbered rings, these particulars being chalked or painted on the doors to the runs thus : red, yellow, blue, etc. This will assist in the recording of the eggs.

Line-breeding.—Whilst closely related to in-breeding, line-breeding is the correct method of breeding, no matter whether eggs or fancy points are being bred for. We do not mate brother to sister, which is *in-breeding*, but father to daughter, son to mother, etc. Line-breeding enables the poultry-keeper to go on breeding year after year without resorting to any out-cross. Thus a strain is established and special peculiarities retained and improved. The chart here given to explain the system of line-breeding was cleverly designed by Mr. Felch, the veteran American judge. We start at the top with a *male* and *female* (1 and 1*a*)—both unrelated. These have been selected because they possess excellent points that we wish to preserve and improve in all further stock bred. They may be tip-top exhibition birds, or the hen may be the best layer on the farm and the male a son of a 280-egg mother. In following the system of breeding success will not come unless the breeder selects as he goes along, using those birds that are nearest the ideal he is striving for. If there is a tendency in the original male towards *bad eye colour* (all other points being excellent), this fault will be corrected in the original female, and in all later matings

those birds with sound eye-colour will be used as breeders. The same selection must be carried out if heavy egg-production is the objective.

To explain the chart, we mate the male to the female, which mating gives us circle 2. Below the circles will be found the fraction of the blood of the parents the progeny in the circle possess. Thus the



progeny of No. 2 possess half the blood of the male or father and half the blood of the female or mother. The second season we mate the selected cockerel from group 2 to the mother and the selected pullets from circle 2 to the father. Circles 3 and 4 are produced, each of the progeny possessing three-fourths of the blood of the parent on the side the circle appears. The system is the same throughout, each black line denoting that a male has been chosen from the group from

which it starts, and each dotted line a female. Chickens from circle 3 possess three-quarters the blood of the mother and one-quarter the blood of the father, etc. To work this out take the original female as 1 and add $\frac{1}{2}$ as representing the female (or mother's) blood. We must divide by 2 as being from two parents, and so get the $\frac{3}{4}$ at circle 3. The third year a cockerel from 4 is mated to a pullet (or pullets) from circle 3, each containing three-quarters of the blood of the sire and dam respectively, and the progeny at circle 6 will have half blood again as at circle 2. The same formula is followed; we take three-quarters as the male bird from group 4, add thereto one-quarter as representing the male's blood in group 3 and divide by 2. *The direct object of the line-breeder should be to come back repeatedly to this half-and-half blood, and that is made possible by this system of breeding, without going outside the strain.*

A cockerel from circle 3 is next mated back to the original female, giving us circle 5, the blood of the progeny being seven-eighths of the original female's, *i.e.* $1+\frac{3}{4}\div 2=\frac{7}{8}$. Those in circle 7 will possess seven-eighths of the original male's blood and one-eighth of the female's. Circles 7 and 5 when mated together give us the desired half-and-half blood at circle 10.

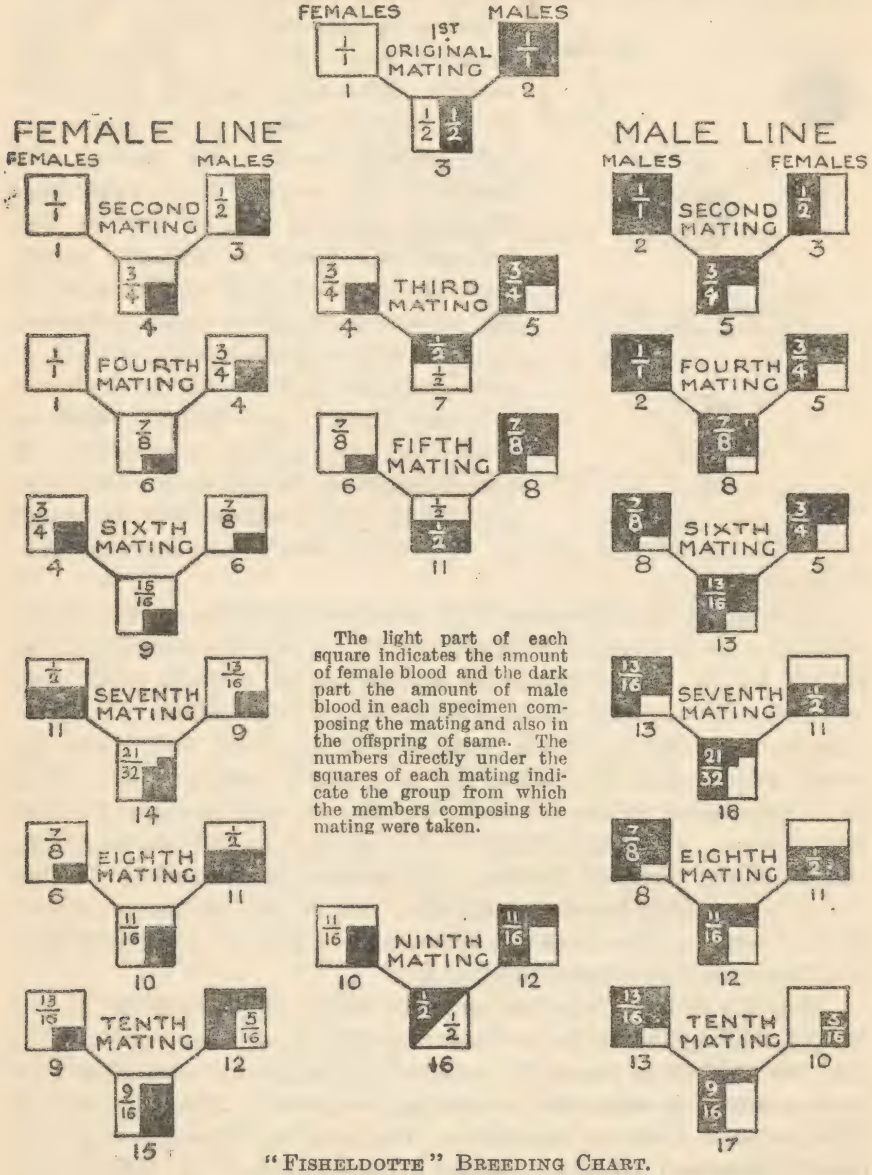
Line-breeding will help the exhibitor who has to adopt double-mating, for if he needs a *pullet-breeding cockerel* all he has to do is to mate a cockerel from circle 5 (containing seven-eighths of female blood) to a pullet from circle 3 (containing three-quarters female blood) and the cockerels at circle 8 will possess thirteen-sixteenths female blood.

Male and Female Lines.—To help the novice still further I give a chart from that bright Annual, the "American Poultry Journal Year Book," showing the female and male lines separately. Commencing with an unrelated male and female, we mate them together the first season. From the offspring the healthiest, strongest, and in resemblance to the parent most perfect cockerel must be selected and mated with his mother to start the "female" line. The original male is mated to those of his daughters that most resemble him, and the male line thus started. The matings should be as per the chart previously dealt with and should read :—

1st	mating	F. (female) 1 to M. (male) 2	
2nd	,,	F. 1 to M. 3; M. 2 to F. 3	
3rd	,,	F. 4 to M. 5	
4th	,,	F. 1 to M. 4; M. 2 to F. 5	
5th	,,	M. 8 to F. 6	
6th	,,	F. 4 to M. 6; M. 8 to F. 5	
7th	mating	F. 11 to M. 9; M. 13 to F. 11	
8th	,,	F. 6 to M. 11; M. 8 to F. 11	
9th	,,	F. 10 to M. 12	
10th	,,	F. 9 to M. 12; M. 13 to F. 10	

The members of groups 3, 7, 11, and 16 contain then the half-and-half blood that is desired. In commencing line-breeding one can, of

course, start with several hens or pullets as one of the units, but all should be *related*. We *must* start with high-class original stock, and



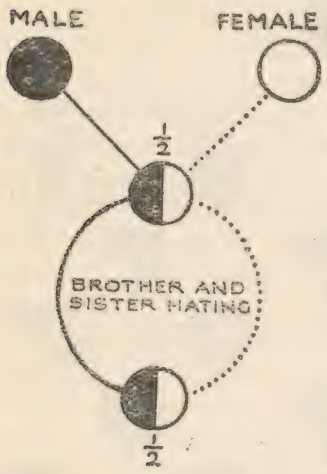
The light part of each square indicates the amount of female blood and the dark part the amount of male blood in each specimen composing the mating and also in the offspring of same. The numbers directly under the squares of each mating indicate the group from which the members composing the mating were taken.

"FISHELDOTTE" BREEDING CHART.

(I. K. Felch System; designed by L. A. Stahmer.)

once Palace or Laying Contest winners are bred others will follow, for line-breeding is not "chance" work. With line-breeding a stud-book to keep track of all birds mated or bred is essential.

Danger from In-breeding.—Line-breeding is often confused with in-breeding, so that I must give a brief explanation here. Generally speaking, *in-breeding* may be taken as the mating of brother to sister, which gives half-and-half blood. I have drawn a small sketch to illustrate this mating. The original male is first mated to the original female, giving progeny of half-and-half blood. By mating the brother in this progeny to his sister from the same group it will be noticed that half-and-half blood is still the result. Now, many breeders of exhibition stock and even pedigree layers do mate brother to sister *to fix a certain point, quality, or peculiarity*, but it must only be done *once in a way* if at all, and then the stock so mated must be vigorous and healthy. If the in-breeding is continued the next generation, the progeny will be small and inferior. Should you try in-breeding, don't go as far as in-and-in-breeding.



Introducing Fresh Blood.—When it is found that the strain you are working on falls short of a certain quality, it may be necessary to go outside for it. In going out for another strain, exercise great care, as if you make a mistake years of hard work will be spoiled. Cockerels almost invariably mark all progeny with blood in their veins for years, so introduce fresh blood by means of a hen or pullet. Mate this fresh female to the selected male of your own strain and watch the progeny. If all is well, the latter can be brought into your own strain. Keep plenty of brothers and sisters close at hand as reserves in case some of the breeding birds die. Should you by chance run out of the strain, purchase from any customers you have supplied with eggs, and then you will sure to be alright.

Mendel's Law.—I was not going to touch upon Mendel's law for fear of making this volume thicker by 200 pages, but will just dip into the subject to please the critics and those who remember that most interesting school-day amusement—algebra. Mendel says that where crossed forms or hybrids are bred together the opposing characters possessed by the original parents combine in *definite proportion*. The progeny from A mated to B will represent $A^2 + 2AB + B^2$. To translate this we shall by mating A to B have out of every 100 chicks 25 possessing the characteristics of A, 25 with those of B, and 50 a mixture of A and B.

CHAPTER IX

Breeds as you should Know them.

The best breed—Study the soil—Select popular breeds—Stock light and heavy breeds—Breeds for the backyard—Breeds for the poultry-farmer—For the farmer—For Intensive work—Sitting varieties—Non-sitting varieties—Table breeds and crosses—Breeds I admire—A "War" breed.

A GOODLY number of poultry-keepers argue that there are far too many breeds of poultry, and blame the "fancier" for continually adding to the already long list. Personally, I think we cannot have too many breeds, as each new variety means another spoke in the wheel of the Poultry World. Some argue that every new breed introduced to the poultry public delivers an ultimatum to an older and nobler variety. This I fail to agree with, as a variety stands or falls by its usefulness. A boom may celebrate the introduction of a new breed, but if the latter does not come up to expectations its popularity ceases. There is plenty of room for all varieties that have qualities sufficient to recommend them to poultry-keepers.

The Best Breed.—One of the first things a beginner asks is, "Which is the best breed?" Taking the question as it stands, I may say that there is no "best" breed, as it is more a question of strain. There are many breeds that are about equal in merits and popularity, but in making a selection "strain" must be considered. There are good and bad strains in every breed, and it is the former that should appeal to the poultry-keeper. By reason of the above, the poultry-keeper should not be in a hurry to condemn a breed as a failure, as he may possess a bad strain, and a change of blood would mean all the difference between failure and success. After strain come feeding, management, housing, etc.—items that must not be lost sight of. In selecting a breed, too, one must study the nature of the soil, environment, etc., for how can a variety do well if it is out of its place.

Study the Soil.—It is essential that the soil be taken into account in selecting a breed. *Gravelly soil* suits any breed—a point that is well worth remembering when taking a farm. *Clay soil* will naturally

not be suitable for light varieties, and so some of the heavy breeds must be selected. For wet, retentive soil, such as clay, I know no breed to beat the Sussex, and after this come Wyandottes, Rhode Island Reds, and Plymouth Rocks. *Chalky soil* seems to suit table breeds very nicely. When commencing poultry-farming it is advisable to find out which varieties do well locally, and give these a trial. One can easily get acquainted with such facts by inquiring of local poultry-farmers. A breed that has done well in one locality for so many years (such as the Sussex in the county of Sussex, the Orpington in Kent, and the Redcap in Derbyshire) must naturally suit the soil in that district, and should be found a place on the farm. Ireland seems to suit practically any breed, whether sitter, or non-sitter.

Select Popular Breeds.—Where the owner's harvests will include (1) sittings of eggs, (2) day-old chicks, and (3) stock-birds, he must naturally hit upon popular varieties where the demand for eggs, chicks, and birds is good. It would be useless to stock a variety exclusively if that breed was not a favourite, and so had no following. If the poultry-keeper is only interested in eggs for marketing, he can please himself which breed he takes up, so long as he is satisfied as to its laying merits.

Stock Light and Heavy Breeds.—It is wise, too, to stock both light and heavy breeds, not only to be able to supply sittings, chicks, and stock birds in both kinds, but to equalise the supply of eggs the year through. Generally speaking, it is the heavy breeds that excel as layers in the winter months, the light varieties performing well in the summer. I would not go so far as to say that light breeds are *purely* summer layers, for there are many such varieties—the Black Leghorn especially—that lay well in winter. It is a good plan, however, for the poultry-keeper to stock both kinds. Light breeds do not, perhaps, eat so much as the heavy varieties, but do not be misled into stocking only light kinds on this score.

Breeds for the Backyard.—In selecting a variety for the backyard run, we must hit upon one that does well in confinement. Next we must consider environment, and go for a dark-plumaged bird that will not show the dirt. Croad Langshans, Buff Orpingtons, Buff Rocks, Black Wyandottes, and Rhode Island Reds are amongst the *Heavy* varieties that do well in a backyard run, whilst in *Non-sitting or Light* breeds we have Black and Brown Leghorns, Black Minorcas, Sicilian Buttercups, Black La Bresse, and Black Hamburghs. The above breeds are for runs in smoky towns, and as lighter-plumaged varieties are suitable in certain localities, I mention a few that do well in confined runs: *Heavy*—Barred Rocks, White Orpingtons, White 'Dottes and Light Sussex; *Light*—White Leghorns, Anconas, and

Campines. Blue-plumaged varieties also look nice and include Blue Orpingtons and Blue Wyandottes in *Heavy* breeds, and Blue Leghorns and Andalusians in *Lights*. For the sake of equalising the supply of eggs the year through (as previously mentioned) those backyarders who have the space should keep a Light or Non-sitting breed as well as a Heavy or Sitting variety.

Breeds for the Poultry-Farmer.—The poultry-farmer whose harvests are eggs for sitting, day-old chicks, and stock birds will aim at popular breeds. Those varieties that do best on his particular soil *and are popular* will be specialised in, more pens being kept of such varieties than any other. He must, however, stock a representative list of breeds, as satisfied customers will come for sittings, etc., in *all* breeds that have merit and are popular, and it is unwise to disappoint. My ideal farm would quarter :—*Heavy*—Rhode Island Reds (both Rose and Single combs) ; Buff and White (and perhaps one pen of Blues) Orpingtons ; Buff and Barred Rocks ; Light and Speckled Sussex and White Wyandottes. *Light*—White, Black, and Brown Leghorns, Russian Orloffs, Black Minorcas, Sicilian Buttercups and La Bresse. At the start I might try one pen of each breed, and might be persuaded to add in *Light* varieties one pen of Anconas, Andalusians, Campines, and Hamburghs. During my first season I should take stock of the orders received and hatch eggs from those varieties that seemed in favour and demand, so that the next year there would be more pens of those breeds than other less-in-demand breeds. As I have said, one must specialise in certain breeds, but it is wise to have a single pen in certain other breeds to meet the demand. One man's taste is not another's, and so you might find a run on Black Minorcas which would be disappointing were that variety not kept. In having Black and Brown Leghorns one is able to offer a customer Brown Leghorn eggs if the Black Leghorn sittings are booked up. Arrangements can, of course, be made with other poultry-farming friends for sittings of eggs in breeds not stocked, but in each case before supplying the order notify the customer of what you propose doing, assuring him that your friend's birds are well-bred, etc. The breeds mentioned above are very popular in both worlds of Poultry—Fancy and Utility.

Breeds for the Farmer.—For ordinary farm work or where free-range can be provided, some of the active varieties that find a good proportion of their own keep must be considered. Leghorns, Campines, La Bresse, Anconas, Hamburghs, Minorcas, Sicilian Buttercups, Russian Orloffs, Andalusians, etc., are active and sprightly *Non-sitting breeds* worth attention. Then, of course, first-crosses are to be recommended together with such *Heavy or Sitting varieties* as Rocks, Wyandottes, Sussex, Rhode Island Reds, and Orpingtons. For

egg-production the general farmer will score if he stocks a few non-sitters, a number of sitters, and a reasonable quantity of laying first-crosses at the start, and having put them all to the test, goes in more for those varieties that do well and suit the soil.

Breeds for Intensive Work.—For the Mammoth Intensive Houses many prefer *Light* varieties, such as White and Black Leghorns, Campines, Minorcas, Sicilian Buttercups, and Anconas, but here again one will do better in "mixing" it so as to equalise the egg-supply all the year round. Of *Heavy* breeds that will do well in Intensive Houses I may mention Light Sussex, Rhode Island Reds, Buff Rocks, White and Black Wyandottes, and Buff and White Orpingtons.

Table Breeds and Crosses.—This side of the Atlantic the public fancy is for a white-legged and fleshed table chicken. Those with yellow legs and skin are not appreciated, although, of course, customers *will* buy them. In America it is just the opposite, for yellow-legged and fleshed chickens are there considered ideal. The Dorking is a noble table fowl that has been popular from old time. Its colour of flesh and leg is white, and whilst it can be kept pure many prefer to use crosses from it for table purposes, maintaining that they obtain quicker growth and more weight. There is no doubt that crossing has its advantages. Old English Game-Dorking, Indian Game-Dorking and Dorking-Buff Orpington are excellent crosses. The Sussex is a good table breed with white flesh and leg, and can be used pure or crossed. Old English Game–Sussex, Faverolles–Sussex, Orpington–Sussex, are all excellent table crosses. The Indian Game has a yellow flesh and leg, but the Indian male is ideal to cross with Dorkings, Sussex, Faverolles, or Orpingtons. The Old English Game and Houdan have white flesh and leg and are noted for crossing with the table breeds mentioned above, Game or Houdan males being used. The Faverolles, too, is an excellent table variety with white leg and flesh, and a quick grower, as is, of course, the Orpington. The males of either are excellent "heads" for crossing purposes. A variety with a wonderful breast and most beautiful flesh is the Bresse—well worthy of attention from those engaged in the raising of table poultry. It is a French table variety, and the French are fine judges of what a table chicken should taste like. We next come to a War-breed—the Russian Orloff, which like the Bresse, is a non-sitter yet a wonderful table variety. Of crosses for table purposes, those I have more than a liking for are: Indian Game × Dorking; Old English Game × Sussex; Faverolles × Sussex; Houdan × Buff Orpington, and Indian Game × Buff Orpington.

Sitting Varieties.—Sitting varieties are those that by nature show a desire to sit or incubate their eggs. They are also termed "Heavy"

breeds and lay *brown or tinted* eggs. I append a table of Heavy or Sitting varieties :—

Aseel	Game, Indian	Rhode Island Red
Brahma	Langshan, Croad	Scots Dumpies
Cochin	Langshan, Modern	Silkie
Dorking	Malay	Sumatra (Game)
Faverolles	Malines	Sussex
Game, Old English	Orpington	Wyandotte
„ Modern	Rock	Yokohama

Non-sitting Varieties.—These, as their name denotes, do not show a desire to sit, although there are exceptions, as some hens will persist in going broody. Such hens, however, are unreliable as broodies and should not be entrusted with eggs. Non-sitters are also termed "Light" breeds and lay *white-shelled* eggs. I append a table of Light or Non-sitting varieties :—

Ancona	Houdan	Redcap
Andalusian	La Bresse	Russian Orloff
Audlem	La Fleche	Scotch Grey
Braekel	Lakenfelder	Sicilian Buttercup
Campine	Leghorn	Spanish
Creve Cœur	Minorca	Sultans
Hamburgh	Polish	Yorkshire Hornet

Breeds I Admire.—In dealing with the breeds of poultry I have departed somewhat from the too common method of praising all varieties alike. Where this is done the novice, after reading about twenty pages on "Breeds," is no further forward than before he started to read. I have endeavoured to place the breeds as I know them in their correct places, and perhaps the following notes will be of further help :—

Ancona.—Active little fowl ; good forager and food-getter ; good scratcher ; small eater, excellent layer of white eggs ; "at home" in confined runs when petted ; worthy of more support.

Andalusian.—Another sprightly breed, also meriting more support ; ideal forager and small eater ; layer of large white eggs ; suitable for both confined runs and free range.

Campine.—Yet another busy-body ; active ; fond of scratching and so useful in Intensive Houses ; small eater ; wonderful layer of large white eggs ; good forager and money-maker.

Dorking.—All-English breed ; noted table variety, but perhaps slow grower and so better crossed for table purposes with Buff Orpington, Indian Game, or Old English Game ; only a fair layer.

Faverolles.—Ideal French breed ; excellent table merits ; suitable for crossing to improve stock for table ; excellent winter layer ; good all-rounder.

Hamburghs.—Every-day layers of large white eggs ; worthy of more attention.

La Bresse.—Really genuine layer and table bird; wonderful worker and forager; excellent for general farm and other such work; noted French breed; excels breast meat, and cockerels ready for table straight from the run; deserves more attention.

Langshan, Croad.—Capital all-round breed for confined runs or free range; layer of the richest coloured egg; most deserving variety.

Leghorn.—Whites are the popular favourites, having performed so well in all Laying Contests; admire Blacks and Brown, which I consider amongst the best winter layers of Non-sitting breeds.

Malines.—Good all-round Belgian breed; excellent table variety and layer of brown-shelled eggs.

Minorca.—Will never die out; "at home" anywhere; working man's fowl.

Orpington.—All-English variety; all colours popular; Buffs most extensively bred; personally admire Whites and Blues—both excellent layers and not so broody as Buffs.

Rhode Island Red.—Charming variety; "at home" anywhere, but good strain is essential; very popular and likely to remain so. Rhode Island Whites might catch on some day.

Rocks.—Barreds will never die; admire the Buffs as layers—great future before them.

Russian Orloff.—New war-breed from Russia; wonderful table bird for non-sitter; will be very popular in years to come; bred in three colours, White, Spangled, and Mahogany.

Sicilian Buttercup.—Very handsome breed; most active and attractive; excellent layer and real busy-body; rosy future ahead of breed.

Silkies.—Charming little creatures; ideal broodies and mothers, especially when crossed with White Wyandottes to get size; too large for a Bantam and too small for a Fowl—a curious "go-between."

Sussex.—One of the finest breeds we have; all-British; wonderful layers and table birds; cockerels ready for table straight from run at early age without fattening; will be very popular in years to come; very docile and attractive; I admire the "Lights."

Wyandotte.—Popular everywhere; Whites have a name in all Laying Contests; Blacks are worthy of support, also Buffs and Blues. Be sure and get a good strain of Whites.

Whilst the Light breeds have an advantage in being excellent foragers and small eaters, the Heavy varieties have the pull over many of them in that surplus cockerels can be taken from the run and are good-sized market birds without fattening. Do not remain loyal to one section, but keep both Heavy and Light breeds in reasonable proportion.

CHAPTER X

Mammoth Houses.

Mammoth brooder houses—How to construct a brooder house—System of raising table chickens—Intensive laying houses—Well-known systems dealt with—The largest laying house in the world—The time for big things.

THE World of Poultry is indeed witnessing many changes. A few years ago one would have said it was impossible to (1) place 20,000 eggs or so in one incubator; (2) stock 3000 layers in one house and under one roof; or (3) house thousands of chickens in one large brooder house. Such, however, are accomplished facts! America has always shown the way in anything big, and her poultry-keepers have demonstrated their skill in chicken-raising and hen-culture on large lines. Not many years ago I saw working on a Kentish farm a 6000-egg incubator of American make and design and thought then what possibilities it opened up for poultry-raising on extensive lines. The chicks, too, were being housed in single brooders to hold 300—one stove only being used, and that fitted up in the centre of the brooder. Perhaps the time is hardly ripe for poultry-raising on a big scale here, but I am confident that the day will come when people will see how neglected the Poultry Industry has been, and then headway will be made at a tremendous pace. We shall see mammoth incubators on every farm then, and the chickens will doubtless pass in their thousands into large brooder houses from these machines, eventually to find themselves housed in mammoth Intensive structures. Say what people may, this "big" system of rearing and housing *must* save money, labour, time, and ground, and increase the profits. Unfortunately, the British poultry-keeper likes to move slowly, being content with the old systems, but the time will come when he will be tempted to experiment, and the results will lead him on to bigger things. Experiments of any kind are bound to improve methods and increase interest, and I would like to see *official* trials in feeding, rearing, housing, etc., at an early date.

Messrs. R. Toope & Co., No. 31, Stepney, London, E., deserve a meed of praise from poultry culturists. This firm has gone thoroughly

into the problems of the Mammoth Incubator and Mammoth Brooder House. They "list" incubators up to 25,000-egg capacity.

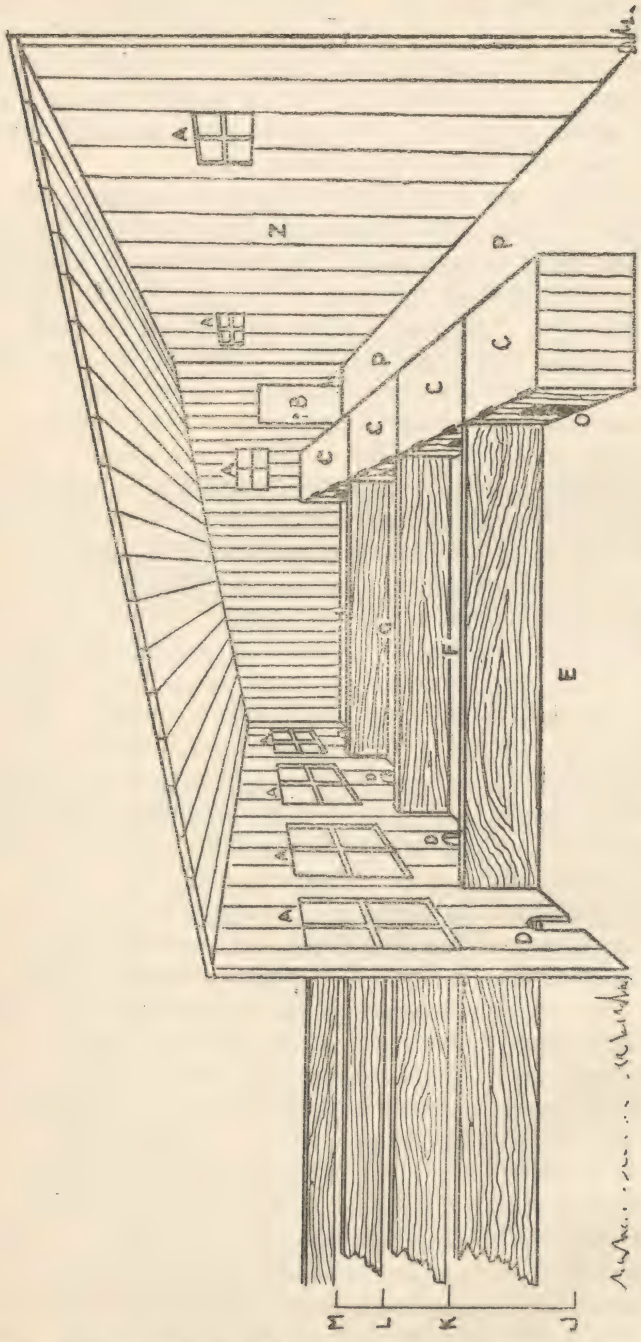
Mammoth Brooder Houses.—No poultry-farm can be complete unless a mammoth brooder house is installed thereon. A brooder house is a boon to any poultry-farmer. Opposite will be seen a side view of a large brooder house :—

A brooder house consists of a large building in which a goodly number of chickens are to be artificially reared. It is divided into runs (E, F, G, H), each about 3 feet wide, wire-netting being used as partitions. The width of the house is usually about 16 feet or 20 feet, a gangway (P) running down the side of the house from the door (B), so that the attendant can pass along to attend to the hovers (C). Windows (A) are fitted to the house to admit fresh air and sunshine. There is an outlet (D) through which the chicks pass into the grass runs (J, K, L, M) without. On the wall (Z) shelves can be fitted if desired to hold small accessories. The chicks are accommodated in a covered hover (C), which is easily opened, the top being hinged at the back. Each compartment or sleeping box has an outlet (O), through which the chicks pass. There are several ways of heating the hover. In one type hot-water pipes (outflow and return) run through the hover, just under the lid, and above the chicks, the water being heated by an oil, gas, coke, coal or petrol-heated boiler or furnace.

Another method of heating is to run a lamp (with guard) in each compartment, whilst many run small separate brooders with lamps in, each the width of the indoor run. To allow for the difference in ages, the hovers near the lamp for the baby chicks are in some houses of ordinary size, but they get larger as they near the other end where the older chicks are. By this method the compartments are cooler the further they are from the lamp, *i.e.*, of course, in the pipe system. The best plan is to visit a farm where one of these mammoth brooders is installed and carefully inspect it and inquire as to the results. In other types of houses the pipes are underneath and the heat rises into each hover near the top of one of the sides. Each compartment can be controlled as regards the degree of heat in this type of brooder by means of a damper.

One hundred chicks are placed in each compartment and the usual method is to move them to the next run each week. It is in the raising of table chickens that the brooder house will prove invaluable. Early hatching is essential to corner the best trade, and the rearer need fear nothing if he has a cosy brooder house where the little chickens can be kept warm. One hundred chicks are placed in the first section, and these are shifted up into section 2 the next week to make room for another hundred day-olds. This shifting is repeated

each week, and section number 5 will always house five-weeks' old



MAMMOTH BROODER HOUSE.
(*See Text.*)

chickens. Each indoor run or section is bedded down with peat

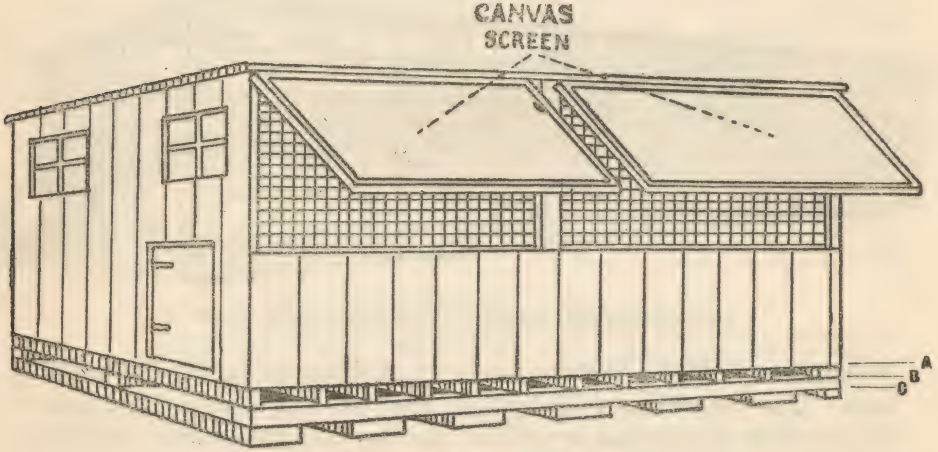
moss, or chaff, a sprinkling of Izal thereon being advisable once a month for disinfectant purposes. In the cold weather the outer runs are not used. A brooder house 36 feet in length will take twelve runs, and that should be the minimum length if one is engaged on the raising of table chickens. The chickens should be in the brooder house for about eight weeks, then have a run on the grass in a cold brooder or house, and finally end up in the fattening pens.

As the chickens get older the runs may be on the small side to take a hundred of them. For this reason some rearers either have the end runs made wider or have more of the 3-feet runs, so that the older chickens can be divided up into lots of fifty at one size, and later to lots of twenty-five. The rearer must use his common-sense in all things. A brooder house will carry a thousand or more chickens quite easily, and despite the cost, there is the saving of labour. Where separate heated hovers are used, more labour will be necessary than where the pipe system is adopted. These houses cost a good sum, anything from £20, according to the size, but they soon save the money spent on them. Any one engaged extensively in the day-old chick trade cannot afford to be without a good-sized brooder-house. Any appliance firm will be pleased to give an estimate for a brooder-house and will erect it exactly as the owner desires. When the brooder is not in use the outer runs should be folded up and placed under cover. The ground should be sown with lucerne to sweeten it. A large shed can be built against the back of the brooder house to accommodate the hatching, etc., appliances when not in use. The brooder house will act as the back, so that only the top and supports are necessary ; the sides can be covered with wire-netting with tarred sacking over it to keep out the rain. This will economise. If necessary, a fattening shed can be erected against the brooder-house. The brooder-house, I may say, should face the south, for the chicks to get the benefit of the sun and be protected from the north and north-east winds.

Mammoth Intensive Houses.—When the Intensive System arrived in England from America I saw a great future before the mammoth houses. I have always had a good word for them, and my writings in the Press and books have encouraged many to instal them on their farms. Many of the critics condemned them on sight, but there are scores and scores of houses now in use which have for the most part given entire satisfaction. In fact, not long ago I supervised the building of a large Intensive house for 1000 hens in a London back-garden, and there is in London at the present time an exclusively *Intensive poultry-farm.* An Intensive house is a large building to hold from 50 to 3000 laying hens under one and the same roof. A minimum of 3 square feet of ground space is allowed each bird, and the main object is to be able to keep a very much larger number

of birds on a given piece of ground than could be kept under ordinary conditions. The houses are built in one and two storeys, the former for flocks up to 500 and the latter for larger flocks. The two-storeyed or "double-decked" Intensive house accommodates the laying hen on both top and bottom floors, a stairway at each end enabling the owner to gain access to the top storey through the attendant's door.

The advantage of Intensive houses lies in the fact that full use is made of the healthy open-fronted type of structure. They should be boarded half-way up, the top half of the front consisting of wire-netting, covered by muslin screens to regulate the wind and rain. In the roof glass panels are fitted to allow the sun full play. Below I give a sketch of a useful Intensive House to hold 100 hens.

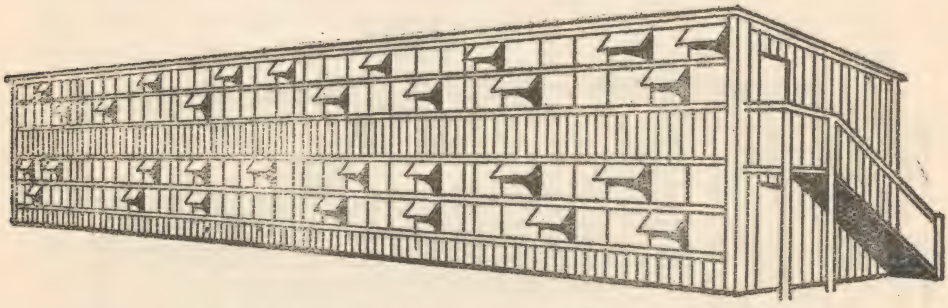


INTENSIVE HOUSE FOR 100 HENS.

This house is 16 feet wide by 20 feet long, and will—at the rate of 3 square feet of ground space per bird—house 100 laying hens. The front is boarded up half way, with wire-netting (covered with canvas screens) over the top half. There are windows and attendant's door at one end and a glass window in the roof. The house faces south to get all possible sunshine. To ensure dryness, the house stands on (A) joists, (B) a 10-inch board, and (C) creosoted railway sleepers. Where one is housing 500 hens or more, it is considered advisable to divide them up into lots of 100 each in compartments measuring 16 feet deep by 20 feet long—the former being the depth these large houses should be built. Wire-netting partitions will do. A house 300 feet long by 16 feet deep will divide up into fifteen sections each 20 feet long and holding 100 hens, and there will be sufficient accommodation for a total of 1500 birds.

I give below a sketch of a double-decked Intensive house to hold 1000 layers. The house is divided into 10 sections—five upstairs and five down—each holding 100 hens. It is 16 feet wide by 100 feet long. The companion-way to top floor will be noticed, as will the canvas screens—some open and others closed.

The largest Intensive house in the world was built some time ago by Mr. Randolph Meech of Poole, Dorset, at a cost of £450, to accommodate 3000 layers. It is best, perhaps, to divide the houses into sections, to confine any outbreak of disease. The object of these large houses is to keep the birds dry overhead and underfoot—the reason backyarders get full egg baskets—and to make them scratch and lay, the floor is bedded down with two inches of sand and sifted soil (mixed), and some six inches (depth) of wheat or rye straw. It is



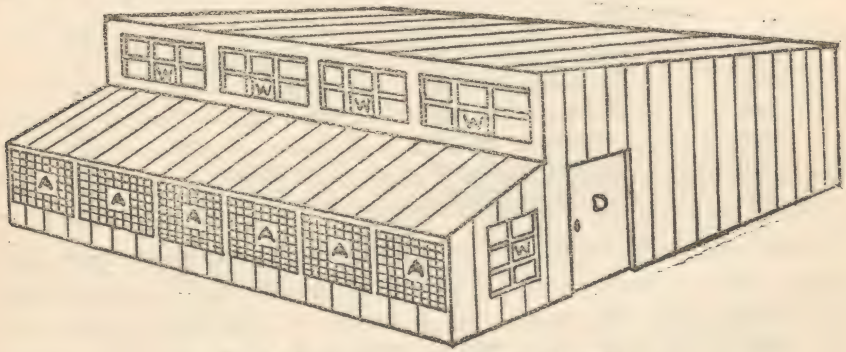
DOUBLE-DECKED LAYING HOUSE FOR 1000 HENS.

best to let the fowls chaff the straw by their scratching for the buried corn. The birds must work for their food and keep busy all day long. All available space must be utilised, and for this reason every internal fitting is well off the ground—nest-boxes, perches, dust-bath, troughs (hanging up when not in use), etc. As regards the internal fittings, the perches must be fixed at the back of the house and have drop-boards underneath; the fowls have the space underneath to scratch in. The nest-boxes are arranged along one side of the house and are several feet off the ground, the hens flying up on to the board in front. The grit receptacles, drinking vessels, etc., are placed on a table so that the hens can scratch underneath the latter. The dust bath stands clear of the ground on legs, and the food trough is hung up on the wall when not in use.

Breeding from hens kept in these Intensive houses will end in failure, many argue, but Corning, the well-known American Poultry-Farmer, runs male birds with his "Intensive" layers. He ought to know! For hens to do well in these mammoth structures they ought, if possible, to be quartered therein in the growing stage and so get accustomed to the surroundings. There are many who advocate

keeping the hens on the semi-Intensive System, which means that the layers are provided with outside grass runs for use all the year round. This is all right in the spring and summer when the weather is fine, but why kill the object aimed at by letting the birds out in all weathers in the winter? If a hen gets her feet wet she is no good as a layer, so let us keep to the Intensive System in the winter months by confining the layers and letting them scratch under cover for the buried corn. As regards feeding, I have touched upon this subject in the chapter on "Feeding." Broodiness must be cured early if the egg-baskets are to be full, and disease and vices must be attended to at once. The drinking vessels can be kept outside the house with their necks or cups inside, if necessary, and this is perhaps advisable, as it has been found that the hens roost on the table and their droppings sometimes go into the water. At one time the perches were fitted along the entire back of the house, but it was found that the hens crowded together when roosting and perspired, which led to roup, etc. Now the perches are run at right angles to the back, so that but a few hens can get on each. A number of good-sized holes should be bored (with brace and bit) along the entire back of the house at the top to permit of good ventilation, which precaution, in any house, will prevent colds and roup.

Below I give a sketch of a neat open-fronted Intensive house—Dr. P. T. Woods' design—as used in America. There is nothing to



NEAT DESIGN OF INTENSIVE HOUSE.
(A. Wire-netting; W. Windows; D. Attendant's door.)

beat fresh air, and that is why open-fronted houses are and ought to be popular.

This house has an open front only covered by wire-netting. The windows are kept closed in the winter and wide open in the summer. The roosts are fitted along the back.

There are several well-known systems connected with Intensive houses. The average house used by Messrs. Corning Bros.—the

largest Intensivists in the States—holds 1500 layers, and the average per bird is over 145 eggs for the season. Corning thinks that 2000 layers can be kept profitably in one flock and in one house. He keeps White Leghorns, does not trap-nest, and keeps breeding males with the Intensive hens. He likes a double-decked house 20 feet by 16 feet for 85 birds. These houses are 12 feet high in front and 10 feet at back, the upper storey being 7 feet high in front and 5 feet at back, with the lower storey 5 feet.

On the Rancocas Poultry Farm, New Jersey, there are about forty large Intensive houses, each holding 500 birds—a total of 20,000 layers. A yearly output reads—500,000 marketed eggs, 92,210 eggs for sitting, 5000 broilers; 7000 layers sold and stock renewed to replenish the farm. Each house measures 100 feet by 14 feet wide by 9 feet high in front and 4 feet at back—about 3½ square feet per bird. A male is used for every 25 hens, with hatching fertility nearly 95 per cent. A hen hospital is in use, and the incubator capacity is 100,800 eggs—252 machines to hold 400 eggs each.

One Intensivist has mapped out a plan whereby 60,000 eggs per annum may be expected to the acre. His birds (all White Leghorns) he maintains average 165 eggs per annum, each costing 6*s.* 6*d.* for food and labour, and showing a profit of 10*s.* 10*d.* per year, or as he reckons 9*s.* 2*d.* The eggs are valued at an average price of 1*s.* 4*d.* per dozen. The following table gives (A) the number of birds to stock, (B) the eggs produced, (C) the number of houses, and (D) the number of acres.

A.	B.	C.	D.
2000	250,000 to 300,000	Five 180 feet long	5
1600	200,000 to 240,000	Four ,, ,,	4
800	100,000 to 120,000	Two ,, ,,	2
400	50,000 to 60,000	One ,, ,,	1
200	25,000 to 30,000	One 90 feet ,,	½
130	16,000 to 20,000	One 60 feet ,,	¼

Additional land would be required for growing green food and rearing stock to replenish half the adult stock annually. As to profits, he considers that the figures below would be obtained, exclusive of the value of manure, some £80 to £100 each year per 2000 layers. The profit is arrived at by allowing 9*s.* 2*d.* profit per hen.

Hens.	Profit.
2000	£900
1600	720
800	360
400	180
130	70

There is not the least doubt that these Intensive houses offer

excellent possibilities. I consider that one or more should be installed on every poultry farm. As accommodation for winter layers, young growing stock or moulting birds, they would prove a boon. Common-sense management with such large numbers of layers is, of course, essential.

Before closing this chapter I would like to give particulars of my friend Mr. T. W. Toovey's large brooder-house as installed on his farm at King's Langley, Herts. It is a long, narrow building 252½ feet long, 7 feet 6 inches wide, 7 feet high in front, and 6 feet 6 inches at back, and accommodates 1500 chickens. A corridor 2 feet 6 inches wide runs the whole length of the house at the back, in front of which are the pens, each 5 feet by 2 feet 6 inches wide. The part of pen next the corridor is divided off for the hen, this being 1 foot 9 inches by 2 feet 6 inches. The chickens run through the barred fronts to the 3 feet 1 inch dry run beyond and through a trap-door to the open run beyond this. The pens are formed of solid boards for sides and back, and in the front there is a glass window and trap-door, and the rest is wood. The front of the house consists of 2 feet of skirting boards (with trap-doors) at the bottom (also glass window to each pen as mentioned), and above this 5 feet of wire-netting. The bottom 3 feet of the 5 feet wire-netting is controlled by calico shutters, and the top 2 feet—always open—is protected by a fixed wooden hood. The calico shutters are 4 feet by 3 feet, hang on hinges, and can be set at any angle by means of cords running over pulleys and worked from the corridor. The trap-doors, as they should be, are worked in the same way.

To this house are attached 101 runs in front facing south, and 50 at the back, the former measuring 45 feet long by 2 feet 6 inches wide, and the latter 30 feet by 5 feet wide. The chickens have access to both back and front runs by means of movable tunnels across the corridor. The building is lighted with twenty-two incandescent gas burners, so that in the winter the chicks can be fed early and late. The litter used is sand. Ventilation is well-managed, Mr. Toovey's great point being "fresh air for poultry stock."

CHAPTER XI

The Would-be Poultry-Farmer.

When the hen fever comes—The man at the helm—Business methods score—The necessary training—Capital required—Selecting a farm—Poultry and fruit—Out-houses essential—Plan of the farm—Making a start—The season's work—Harvests—Poultry v. *Foxes.*

I DO not think there is any occupation that provides such interesting study as poultry-farming, which should appeal to all desiring an out-door life. Yet there are many who start poultry-farming only to throw it up a few months after. Such persons are in no way fitted for the work.

When the Hen Fever comes.—When a person takes up poultry-culture—whether on small or large lines—he gets what the experts call the "Hen Fever." A fire is kindled within him, and he dreams of what he will and can do, and eventually he does do what he said he would do, but what he really ought not to have done. In poultry-farming one must go carefully. That fever must be kept within bounds, but *not* killed. There are recognised steps to successful poultry-farming, and these must be taken one by one if failure is to be averted. In short, the would-be poultry-farmer must *learn to walk before he tries to run.* He must ever be ready to learn from older hands and be endowed with perseverance and pluck.

The Man at the Helm.—Everything depends upon the man at the helm! The novice always asks, "but how much profit can I make per week on, say, £250?" He does not think that everything depends on how HE spends his capital, his knowledge of poultry matters, and if he has common-sense in abundance. One man may from a capital of £250 make £2 a week profit eventually, whereas another might only make 20*s.* Poultry-farming is no child's play. It takes three or four years to put the house in order, and only those who work hard and persevere come through successfully. Do not expect profits the first year. No matter what the weather may be, the fowls have to be fed and cared for, likewise the chickens. It is, however, a healthy open-air life and one full of interest and study. What is more, even if the work is hard, it is congenial to all who have

the fowls at heart. Here, then, is another qualification: *You must have a natural liking for poultry stock and all that appertains thereto.*

The occupation must be gone into on proper business lines. Strict accounts must be kept, so that the farmer knows just where he is at the end of the year. He must not stock everything from a Turkey down to a Bantam, but specialise, since *specialising is the thing of the hour.*

The Necessary Training.—If you have kept half a dozen fowls in a backyard, do not run away with the idea that you can run a flock of 500 hens on a poultry farm. 'Tis true your knowledge of poultry matters will help you, but from the first remember that management in each case is totally different. One cannot do better than have twelve months' training on a *selected* poultry farm. Do not go as a working pupil, paying nothing for tuition, but if you can spare the money, pay a good weekly sum, and so be in a much different position. You will then find that the tutor is ready to show you everything and that is what you require for your money. Select a farm where a goodly number of chickens is reared each year, where you can see the incubators and foster-mothers at work. If you proposed going into the egg-farming business, you would not naturally go as a pupil on a purely-exhibition farm.

By having a year's training you will get an insight into a year's work on a poultry-farm, and that is what you want, for each year's work is like the previous ones—the seasons are the same. Make notes as you go on, putting them down on paper for future use, and keep your eyes well opened. Ask if you are in doubt about anything, and read up your subject all the time.

There is nothing like paying visits to poultry-farms to see how things are done, and that is what I recommend all poultry-keepers to do. I would select an up-to-date poultry-farm each year and spend my summer holiday there. Poultry-farmers are really fine fellows, and are always ready to welcome visitors and show them over their farms. An appointment should, of course, be arranged by letter. If you think of going in for poultry-farming, why not spend your summer holiday in a cycle tour of the farms in a certain locality or county? Some plan can be mapped out beforehand, and the farmers acquainted with the fact that you desire to visit them. One farm can be managed each day.

Where circumstances do not permit of the would-be poultry-farmer taking a twelve months' course on a poultry-farm, he may find it advisable to engage the services of an expert poultry-man. *Always treat the latter well and offer him a commission on sales as well as a standing salary.* Such tit-bits are appreciated, and I would not mind paying my poultry-man a little on each chicken reared to maturity above

a certain percentage, and a little on each chicken hatched from each 100-egg machine above a certain percentage. If a poultry-man is engaged, the owner will, of course, spend as much of his time with him as possible so that he can put his shoulder to the wheel and *learn as he goes on.*

Capital Required.—As regards the amount of capital required, the larger the sum the better. I have known people start in a small way on £100, and in a few years possess a really nice farm. For general purposes I may say that £300 should be the minimum capital if the farm is eventually to be a good-sized concern. Of this sum, too, £50 should be held as a reserve for use later on. Many put in their all at the start and just when a little extra is needed to push the thing over the wall to "success" beyond, they have no reserve fund to draw from. A small beginning is essential, and that is where people with unlimited capital go wrong. Because they have heaps of money they spend it lavishly—here, there, and everywhere. That is a mistake, and even if you possess £1000, start in a small way, and treat any surplus as a reserve fund.

Of course, where capital permits, it is best to purchase the farm, for naturally there is nothing like being your own master, to be able thereby to put up any buildings you require. Failing this, a farm may have to be rented, and the rent for one of five acres or so might be from £20 to £30 per annum. A premium is usually asked by the out-going tenant, but this is a custom of the trade and the same everywhere. By advertising in a poultry paper you may be able to purchase the stock and plant of a little farm for from £100 to £150, this including in-going, and if the rent is reasonable, the stock good and healthy, and plant in order, such a course might be advisable. In renting a farm always make sure that it can be had on a lease of from three to seven years, for it would be useless to find yourself with a *notice to quit* after you had worked the farm into going order. Arrange for all such points in the agreement, and also have a clause therein that any houses, runs, etc., constructed by you can be removed as your property. If poultry have been run on the farm, make sure that the soil is sweet. In the case of buying a farm or plant and stock, inquire fully into the reason for sale, and if you are a novice get an expert to call and value the stock and plant for you. The money will be well spent in all cases.

Selecting a Farm.—In selecting a farm soil should be the first consideration. Heavy, clay, or damp soil should be avoided, and the farm should not be too exposed or low-lying. Gravelly or chalky land is best, being always dry and well-drained. The selected farm should not be too small, as one must allow for expansion. A farm of five or six acres would be suitable to start with, and inquiries should

be made to see if further land adjacent or near could be rented. Sloping land—within reason—is always to be preferred for draining purposes, and with the Light varieties quartered near the bottom some protection will be afforded them. Again, the farm must be near a railway station, for the poultry-farmer will have to go to and fro to take produce and bring back parcels, foods, etc. A horse and cart is imperative, and will prove its value in a hundred ways. What is more, a heavy crop of hay will be gathered off the farm for "Amy" or "Topsy." Then we must not forget the markets. There should be several good market towns near the farm to take the produce—eggs and chickens—and here the pony and trap will again prove its worth. London is always a good market, and that is why Surrey, Sussex, and Kent appeal so much to poultry-farmers. Certain parts of Essex are suitable, but others should be avoided.

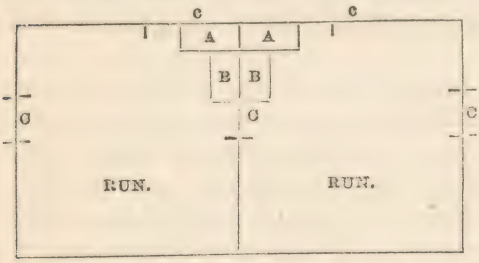
Poultry and Fruit.—Poultry and fruit go hand-in-hand, and preference should be given to a poultry-farm that boasts of a goodly number of fruit trees. By running the fowls on land dotted with fruit trees one gets a double crop—top and bottom—and the trees provide shade for the stock. Take every care of the fruit trees, and have them attended to each season, so that the maximum crop is made possible. Small fruit bushes can be planted over the chicken-rearing grounds, and there is no reason why the fruit should not pay the entire rent of the poultry-farm.

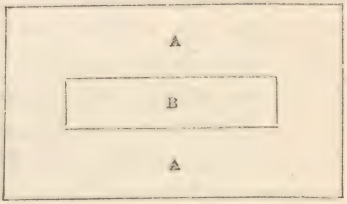
Out-houses Essential.—A farm that does not boast of a number of out-houses is useless for poultry-keeping. One cannot have too many of them, as a use can be found for all, but if when you get into the farm you find it necessary to build out-houses—well, the capital is being eaten up. If the poultry-farmer is handy with his tools, he can easily make some suitable for his purpose, and so save the cost of building special structures. Out-houses are required for (1) Food house; (2) Incubator house; (3) Tool shed; (4) Storage for coops, etc., when not in use; (5) Fattening shed; (6) Hen-hospital, etc.

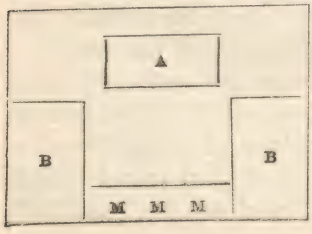
Plan of a Farm.—The out-houses will be grouped together, and where special buildings have to be constructed, the poultry-farmer must be guided by circumstances, *i.e.* as regards their location. The incubator house and brooder house should be near the homestead, as they require attention at night. The chicken-rearing ground should also be near home, so that the poultry-farmer can keep an eye on the youngsters. A small food-house can be constructed in the rearing-ground so that the foods can be mixed there to save the walk up to the food-house proper. Rainwater will be handy to scald (when boiled in the copper) out troughs and drinking vessels, and a tank can be fitted to catch all the water off the out-houses. A shed may be used to store the manure in, and the hay when gathered can be "ricked"

if not sold. If it is disposed of reserve a supply for nesting material and store it under cover in one of the sheds.

Coming to the houses, there are many good patterns on the market, and any appliance firm will build to owner's designs. It is advisable to keep all houses the same style, as such neatness takes the eye of the visitor. The dimensions of the houses will, of course, depend upon the number of birds to be housed therein. Personally, I prefer two large houses built in one, but divided in the centre by wire-netting. This house is placed in the centre of a large run, its back being against the alley or walk. The nest-boxes are also fitted thereto at the bottom, so that the eggs can be collected from the alley side. Now, each section of the house is intended for a pen of birds and is fitted with removable perches and drop-boards underneath. To each house is attached a scratching shed, and a length of wire-netting divides the large run or enclosure into two—one for each pen. There is a door to each run leading from the alley way, and it is always advisable to fit wire-netting doors leading from run to run so that at feeding time the poultry-farmer can walk through the runs without coming out into the alley way each time. In the accompanying plan, A represents the house (divided into two), B the scratching sheds (also divided into two), and C doors leading to alley and other runs. The birds leave the house by a trapdoor, pass through the scratching-shed, which has a hinged door, so that the hens can be shut in on cold or wet days, and out into the grass run beyond. The door to the scratching-shed is made to hitch back when opened. The front of the scratching-shed (A) consists of matchboarding, but B is cut out and covered with wire to admit sun and fresh air. Over this aperture a sliding shutter is fitted, which works in a groove so that it can be opened to any extent according to the outer elements.







I give here a sketch of the front of the house facing the alley. It represents, of course, two houses in one, as previously mentioned, a wire-netting partition (covered with canvas to prevent the birds from fighting) dividing the two. M represents the nest-boxes, fitted like ⊐, so that the

hinged lid can be opened from the outside and the eggs collected. B is the door to each house, and A the ventilating aperture, this being covered with wire-netting. A wooden or canvas screen can be hinged from the top so that it can be wholly or partly closed at night and thrown back on the roof by day to admit sun and air.

Now with regard to the runs, these will be 6 feet high—the top half (or 3 feet 6 inches) of wire-netting and the bottom half (or 2 feet 6 inches) of match-boarding. The latter is used to protect the birds from cold winds and to prevent them from fighting. Wire only can be used for the front facing the alley, or for the bottom if no other enclosure comes up to it. For ordinary breeding pens (male and six to eight hens) these enclosures for two pens may be 20 by 20 yards, the wire-netting down the centre making each run for each pen 20 yards long by 10 yards. Having started from the bottom and built a few of such breeding-pens, commence on the same lines directly opposite, leaving the space between (say 3 or 4 yards) as an alley. The backs of these houses will, of course, face the alley and also the backs of the other houses. These first alley pens preferably leading from the out-houses and the homestead will be for the breeding stock that you will be proud to take visitors to see first.

A second alley must be built further along, the bottom of the runs running up to the bottom of the runs in the first alley. The enclosures in this second alley can be larger, say, each 20 yards by 20 yards, with a large house in the centre, built to the same pattern as the others in Alley 1, but not divided by a wire-netting division. The scratching sheds will be built and divided, but there will be no wire-netting down the centre of the enclosure as in the other case, only one large run being necessary. The object is to run, say, fifteen hens and two male birds in these large pens in the breeding season and sell sittings of eggs at a cheaper rate than that asked for sittings from the three best pens in each breed quartered in Alley 1. One can at any time divide the large house or even enclosure if desired at any time.

My plan, however, is to have a number of these large runs so that they will do for the young stock or moulting birds later on—accommodation-houses and runs, as it were. Supposing on one side of Alley No. 2 these runs and houses are placed the runs opposite can be still larger, say 25 yards by 25 yards, and an increase can be made in the houses. Such runs, etc., would do to carry the young stock up to maturity, as dealt with elsewhere.

Thus in planning the farm everything should lean towards evenness and neatness. I remember walking on to a well-known Derbyshire lady-farmer's farm for the first time, and noticing every house and wooden parts to doors and runs painted a soft shade of red. Inside the runs the birds were a deeper shade of red—Rhode Island Reds—

and you can imagine how such an innovation captivated the visitor's eye at once. The poultry-farmer will get many callers who will be *customers-on-the-spot* if they like the planning of the farm. Bait the hook well and . . . ! Have dainty little sign-posts here and there —"THE SUNNYMEADE WALK"; "THE PLANTATION RUNS," etc.—as such little things will show the amount of interest taken in, and care bestowed upon, the poultry stock.

Making a Start.—Start in a small way, and pay a good price for foundation stock. *Twenty* 10*s.* birds will do you more good than *forty* 5*s.* specimens. If you are by any chance on an exposed site purchase the birds from up North, where hardiness is one of their principal points. Select breeds to suit the soil, and gradually increase and improve the stock. It is best to start in the summer and autumn by getting ready houses and runs so that well-matured pullets of the current year's hatch can be purchased about the beginning of September and placed in their winter quarters. They should be yielding eggs by October and lay throughout the winter if well grown. This is the best plan, for then the poultry-farmer starts off with a good harvest. One can, of course, commence operations by purchasing sittings of eggs or chickens, or both, but he must wait many months before any harvest comes in, meanwhile he may have disappointments by reason of bad hatches, chickens dying, and nine chicks out of ten turning out cockerels. Delay the hen fever if it comes on in February until the summer or early autumn. Even if one is offered a ready-going concern in April it is advisable not to take it if heavily stocked with poultry, as the hens will be broody off and on and have to be fed through the July moult without returns. Again, the fruit and hay may have been sold by the outgoing tenant. Study all these things before making a move !

Business Methods Score.—Poultry-farming is a business, and common-sense principles score over haphazard, trust-to-luck methods. Patronise the local papers for local trade in sittings of eggs, stock birds, etc., but go out for trade further away from home, which is obtainable through the poultry papers. Remember that you have to make a name for (1) your farm, and (2) your specialities. The sooner you make that name the quicker and better the returns. Publicity is everything ! If you can secure a farm opening out on to a main road where motor and other traffic passes, you should be sure of a good "passing" trade. A large sign-board with your specialities painted thereon placed near the road will bring many motors to a standstill for new-laid eggs and table chickens. Get any produce ready by the time arranged, and handing the callers one of your dainty cards, ask them to drop you a line when they will be calling for or requiring other supplies.

The Season's Work.—It is essential that the season's work be carried out at recognised times—see Chapter XIII.—otherwise failure will be certain. Hatching must be in time, and not an egg or chick should be disposed of if it might make one bird less than the number planned for the next season's "home" stock. I have, however, dealt fully with this and other important subjects connected with the season's work in the above-mentioned chapter.

Pupils, etc.—When the farm has turned the corner, the poultry-farmer can look around for assets. There is good money in training and boarding pupils, and such a side-line should not be overlooked. A good pupil will help in the running of the farm and "pay" for so working. Take an interest in the pupils and let them into all the secrets you know. Do not padlock the incubator-house door against them, as many I know very unfairly do. That is why I recommend pupils to pay full prices.

The poultry-farmer will make a nice little sum each year for his hay, and there will be the droppings when ready. An adult fowl's manure totals about a hundredweight per year, and the manure is no small item where five or six hundred fowls are kept. That number would be quartered on a seven-acre * farm, as it is advisable to run about one hundred fowls to the acre. Dropping boards should be fitted under the perches and the manure collected daily. It is courting ailments if the manure is allowed to remain in the houses. Place the manure when collected on the floor of a shed, spread over a few sacks and place other sacks on top. When the manure is dry store in a barrel. Some mix dry earth with it, but this reduces its value. Manure will always be bought by florists or market-gardeners, from £2 per ton being paid. Poultry manure is very strong and has to be used sparingly.

Poultry *v.* Foxes.—Many poultry-farmers are troubled with foxes, and if this is the case, it is advisable to keep padlocks on all the doors and keep the latter closed up at night. Foxes do not like lamps, and if an old guy or two are placed here and there and a lighted hurricane lamp left beside each, this will keep Reynard away.

The Rearing Ground.—In planning out the poultry-farm, do not forget to reserve an acre or so for chicken-rearing. Many omit this. Should the farm being viewed have nice shaded enclosures and other natural protection, it is worth taking if other things are in order.

* One acre or more must be reserved for chicken-rearing.—AUTHOR.

CHAPTER XII

Principles of Poultry Housing.

Ventilation—Perches—Nest-boxes—The Backyarder's house and run—Backyarder's Intensive house—A useful field house—Overtime for hens—Scratching shed under house—The incubator house.

MANY are the designs of houses on the market to-day, all having special points to recommend them. It matters little what the shape is so long as it is hygienic and built of stout timber. Each reader will have a fad of his own, and the best plan when selecting a house is to send for a dozen catalogues from appliance firms; all makes will be found therein. These firms, too, usually display their special houses at such shows as the Dairy (Agricultural Hall, Islington, London, N.), Crystal Palace (Sydenham, London), etc., and poultry-keepers should inspect them. The general farmer will select a house on wheels so that it can be moved from place to place quite easily. The open-fronted house has come to the front in recent years, it having been discovered that hens like plenty of fresh air *without draughts*. Many poultry-keepers, of course, construct their own houses, but when one goes into the price of timber, etc., required, one finds that even a small house costs a nice little sum, and often more than the price asked by the poultry appliance firms. Their profits cannot be large, but I suppose they make in such quantities and buy timber in ship-loads.

Many poultry-farmers build their houses under one roof, dividing the long continuous building as desired. What is known as the spider's web plan consists of one continuous building or a number of houses built in a circle. The runs are then constructed all round to make the square, and a pathway leads up to the centre, where the out-houses, food room, etc., are located. Imagine a large spider's web with the out-houses in the centre, then the sleeping-houses, and finally the runs, and you have the idea.

Perches.—Perches should be about 2 or 2½ inches wide, and the corners should be slightly rounded off each side where the birds' toes go. They should be made removable, fitting in a socket as per the sketch given. Never make the mistake of placing perches one above

the other, as this only leads to quarrelling for the highest perch. If it is necessary to have two or more perches, keep them at the same height. Underneath each perch there should be a sliding drop-board to catch the droppings, and both perch and drop-board should be regularly removed and scrubbed with warm water and Lifebuoy soap. A little sand or sifted earth may be scattered over a piece of felt laid on the drop-board each night, and the felt removed next morning, together with the droppings.

It is advisable to keep a triangular scraper hanging in the house, also a small brush (to dust the perches and drop-boards), and a small bucket of sand or earth.

Ventilation.—There are many ways of ventilating a house. Personally, I prefer an aperture covered on the inside with perforated zinc. Outside a sliding glass shutter can be fitted to slide along grooves. The ingress of air can be regulated by this shutter according to the elements at night. A similar arrangement can be fitted as an outlet. There must be both an inlet and outlet ventilation, the latter being as near the roof as possible, as the fresh in-going air drives the foul air up. The inlet ventilator should therefore be low, but not directly opposite the perches to make a draught for the birds as they roost. Draughts are harmful, whereas fresh air is essential. A few holes can be bored in the door at the top, and similar holes directly opposite. Have houses well ventilated both by day and night. The second or wire-door previously described will enable the owner to air the houses in the day, whilst the main wooden door is left open.

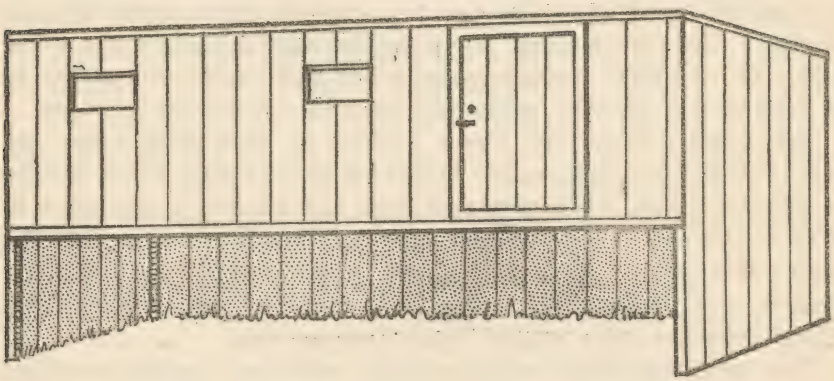
Nest-boxes.—There are many designs of nest-boxes. For the Backyarder's house a cheese box or three-division orange box is usually brought into play. The poultry-farmer has his nest-boxes built so that the eggs can be collected from the outside without going into the house. Whatever is used, the nesting material must be frequently renewed and the nest-boxes regularly scrubbed out. All internal fittings, where possible, should be made removable.

The Incubator House.—Any suitable out-house can be converted into an incubator house. If one has to be built, the following advice should be followed. Double roof and walls are essential to keep the temperature even. There should be about three inches or so of space between each roof, etc., this being packed with shavings, straw, or other litter. In the front there should be a long oblong window made to open and shut for regulating the temperature and airing the house. Ventilation is arrived at by cutting an aperture or two in the back, covering the same with perforated zinc and fitting over this a sliding

shutter. Similar ventilators can be fitted in the front. A bench runs down one side of the house opposite the window, and on this the incubators must stand perfectly level to get the best hatching results.

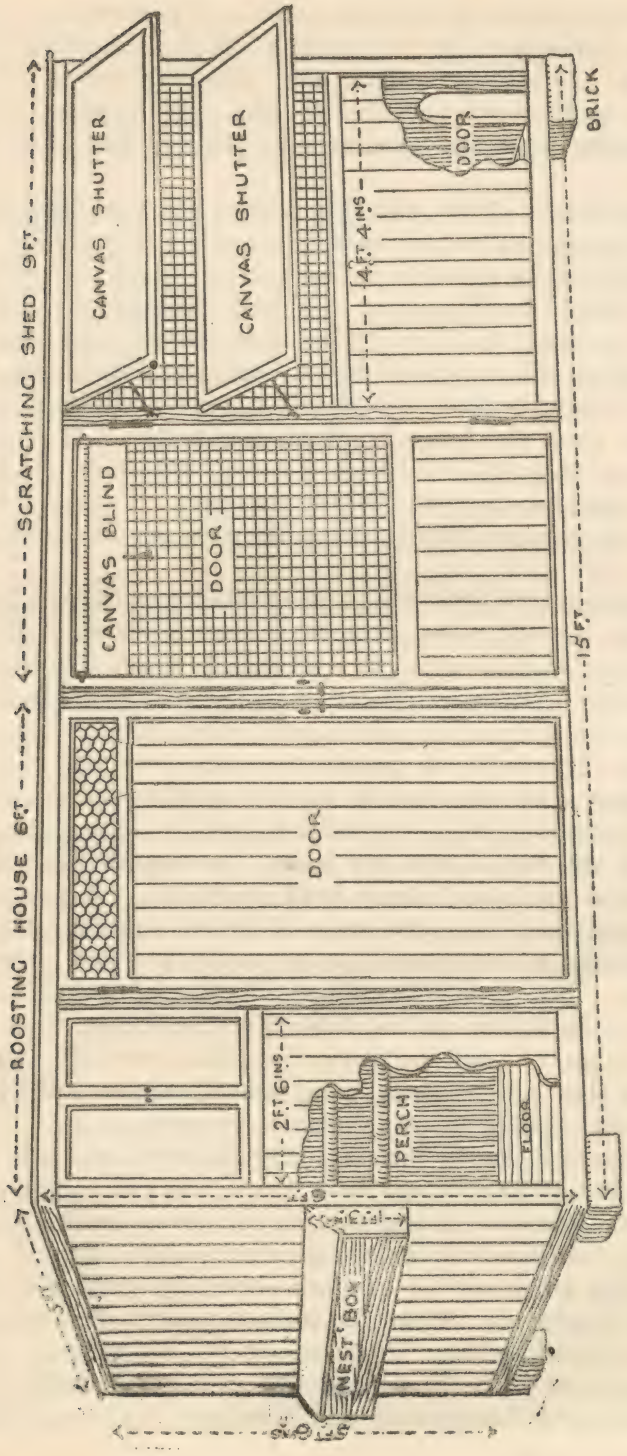
The bench directly under the window is used for general purposes —lamp-filling, wick-trimming, egg-sorting, etc. Over the window a heavy curtain is fitted for night work. Such curtains are handy over all glass windows, such as in brooder-houses, etc., in cold weather. The floor should be of earth to keep the air moist, and not a few water the floor each day as the hatches near their time. Some dig a narrow trench down the centre and keep it filled with water, so as to solve the moisture problem. A large oil-container, too, must be accommodated, as the poultry-keeper must not run out of oil. A porch (A) is necessary (see sketch), so that the door to the lobby can be opened and closed before the door to the main house is opened. This precaution will prevent the temperature from taking a sudden drop, which would happen directly the door of the house was opened if no porch was constructed. A similar porch can be added to the brooder-house. Hang a slate in the house, also a thermometer, fit a shelf the whole way round, and knock a few nails in here and there, and the house is finished.

Scratching-shed under House.—There is a useful design of house where a scratching-shed is formed underneath, the house being built



off the ground. Such a house should prove most useful for birds on the farm, as they would have a cover to run to when it rained. The value of a scratching-shed cannot be over-estimated, and for that reason such houses are worthy of consideration where the birds are on open range.

A Useful Field House.—I give another sketch of a useful field house. This represents a combined house and scratching-shed, the latter making



A Useful Field House.

it possible for the birds to be confined in unfavourable weather. Canvas shutters are placed over the wire-netting front to scratching-shed to provide shade and shelter, and a canvas blind is fitted to the wire-netting door to the scratching-shed for the same reasons. A house after this design would be appreciated by birds on free range in the winter.

The Backyarder's House and Run.—Many are the improvements that could be suggested for the average backyard house and run. The usual practice seems to be to put a post here and another there and let the house "shake" itself together. The best method is first to sketch out roughly on paper the plan of the house and run, and then build to it. The house and run should face the south, and all houses should be built on a liberal scale so that they will house more stock than at first put in. Once the house has been constructed it is impossible to lengthen or widen it. All internal fittings should be removable, so that the house can be kept scrupulously clean. Use stout timber, and where very large packing cases can be procured cheaply these are excellent.

Taking the run first, this should face south or south-west, and the soil should be several inches above the ground outside so that the rain will not go into the run. If a length of match-boarding some twelve or fourteen inches deep is put along the bottom of the front of the run, this will prevent the rain from beating in. Both back and side should be boarded in to protect the birds from rain and wind, as it is imperative that the hens be kept dry underfoot and overhead. The front should consist of wire-netting, and the wire-netting door should be at the end nearest the house. As regards the soil, this should be sifted earth, and always kept scratchable. A good plan is to fix a six-inch plank across the centre of the run and throw the earth from one half into the other until the top section is a foot higher than the lower one. Beat down the soil in the latter, but keep it soft and scratchable in the former one, as the corn will be thrown there. The green food, bones, etc., will be thrown into the lower half, and when finished with they can be easily swept up. This plan will keep the hens occupied and prevent many vices and ailments.

It is unwise to leave the run uncovered, for wet runs are harmful, especially in the winter. Cover both house and run, using match-boarding, and over this tarred sacking or special roofing felt. A sack cut down the sides will make a good substitute. Having spread out the sacking put a tack in here and there, and pour over boiling tar until all is covered. Before the tar has set sprinkle some coarse sand over the tarred sacking. Pitch and tar will make a good coating. Add six pounds of pitch—broken into pieces—to a bucketful of tar, boil until the pitch has melted, and then use. Galvanised iron is

often used as a covering, but it is too warm in the summer and too cold in winter. Where it is used, whitewash the underparts in the summer to take away some of the heat.

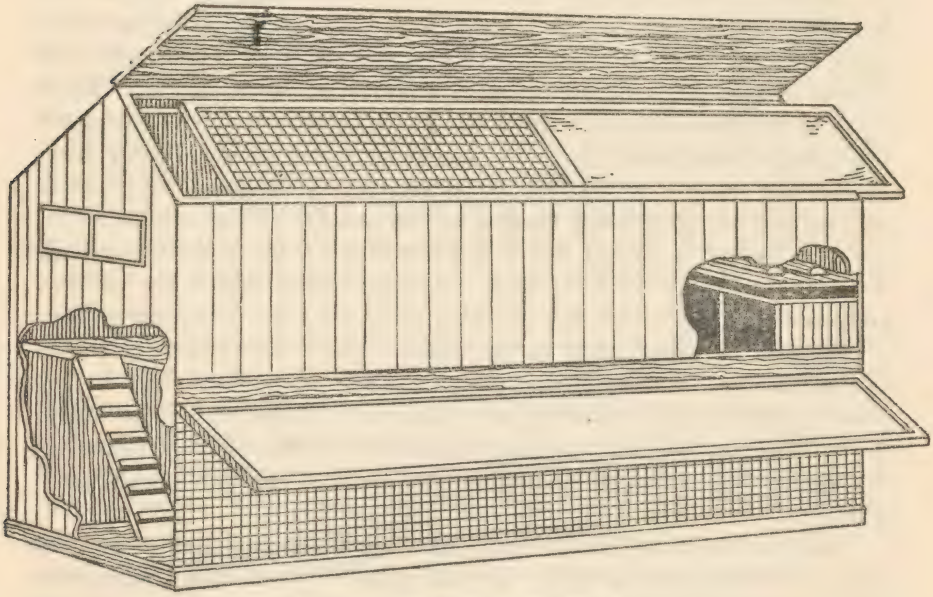
Coming to the house, this should be well ventilated, and this will be the case if there is no smell when the door is opened in the morning. To ascertain how many fowls a house will accommodate, multiply the height by the width, and then by the length, and divide by ten. If a house is 5 feet high by 5 feet wide and 6 feet long, this will be large enough to accommodate 15 fowls, *i.e.* $(5\times5\times6)\div10$, *ten cubic feet of air space being allowed each fowl.* The floor should be of soft sifted earth —kept scratchable—or such litter as peat moss, chaff, etc. There must be a trap-door leading from the house to the run, and the shutter that drops down over the hole should be worked by a pulley from outside the run. If a piece of cord is fastened to the top of the shutter and carried along through staples to the outside of the run, this will act as a pulley, a cotton reel being fastened on the end of the cord. All trap-doors should have such a arrangement. Make the perches and nest-box removable for cleaning purposes, and hang up a piece of camphor in a muslin-bag in the house. Place the drinking fountain in the run upon two bricks, so that the fowls will not scratch the soil into it, and nail two shallow tins to the wall for grit and oyster-shell. A dust-bath is necessary, and any deep box will do. Place fresh ashes in regularly, removing the old, and sprinkle them with Keating's insect powder.

Make all buildings in sections, screwing the parts together so that they can be removed at will. Tar all parts of posts that are let into the ground, also the tongues and grooves of match-boarding, to keep out the rain. In fitting match-boarding also nail it downwards, not lengthwise, to allow the rain to run down, otherwise it will warp. The house should have a good-sized window in the front to admit the rays of the sun, and over this for winter use a thick curtain can be drawn inside the house. Make use of any walls as the back of the house and run.

Many backyarders are ordered to dispose of their fowls by the sanitary inspectors who know nothing about poultry, and do not understand matters. I would therefore advise backyarders to build neat structures for their hens and keep the surroundings spic and span. We have the powers that be advocating the keeping of more poultry, and yet they have in scores of cases lately ordered working-men to get rid of their pets—on the reports, too, of inspectors who could not tell sawdust from middlings. The floor to the sleeping house should be bedded down with peat moss litter.

The Backyarder's Intensive House.—The accompanying sketch is of a small Intensive house as recommended for the backyarder with

limited space at his command. It is divided into two sections—upstairs and down. The floors are bedded with sand and chaff. Nest-boxes and perches are fitted in the top half, and the fowls go from the bottom to the top storey by means of a ladder. A screen is fitted over the wire-netting part of the front, and the roof is made to open both for cleansing purposes and ventilation. A framework of canvas and wire-netting, the latter over the sleeping compartment, is fitted under



Backyard Intensive House.

the roof and slides in and out as required. A glass window is fitted in the side both at top and bottom to admit light and sunshine.

Overtime for Hens.—The hen is a funny creature and easily hoodwinked, as those who have in recent years successfully tried to make her work overtime can testify. The system is usually adopted in Intensive houses during the winter, the idea being by means of artificial lighting to make the hens think they are getting as much daylight as in the summer. At six in the morning incandescent lamps in the house are switched on, and the fowls get up, thinking it is daylight. The lights are turned off at eight o'clock, although a small lamp or two are left burning all night. At four o'clock in the evening the lamps are turned on again till nine o'clock, when they are put out, with the exception of the smaller ones. Many experiments have been tried both in this country and the States on these lines, and egg-production has immediately increased. Some have constructed an apparatus that causes the lamps to light up gradually to resemble dawn of day and make things more realistic.

CHAPTER XIII

Month by Month.

Year's work in brief—Early-hatching—Care of the growing stock—Lime-washing—Tarring and repairing—The moult—New method to cure broodiness—Value of the cockerel box—Value of shelters—Spring, summer, autumn and winter work.

IF there is one thing more than any other that *every* poultry-keeper *must* pay strict attention to it is the season's work. There is a proper time for all things, and if the poultry-keeper once gets behind he will find it very hard, if not impossible, to get straight again. In this chapter I propose touching upon the work that should be attended to each month, and advise all readers—whether back-yarders or poultry-farmers—to put into practice at all times that old precept—"Never put off till to-morrow what should be done to-day."

January.—Exhibition chickens intended for the summer "chicken" shows should see light of day this month. Many *fanciers* put down their eggs in December, so that the chicks may be out on January 1st. The *utility man* will be busy with chickens from heavy table breeds from now onwards, as such will make top prices when ready for the market. The person who raises a lot of chicks—for table or exhibition—will now find a large brooder house a boon. Incubators will be busy, as will broody hens, should there be any about. At this time broodies fetch excellent prices if advertised—those not requiring such early broodies should advertise them. The weather will be unfavourable for hatching, so select healthy, well-feathered broody hens with plenty of fluff, set them in a cosy out-house, and do not give them too many eggs. Do not allow mistress broody off too long, and remember to cover the eggs with a warm flannel whilst she is off the nest. Rear the chickens in an out-house, brooder house, or barn, protecting them from the unfavourable elements. The backyard fancier will have a few exhibition chicks out this month; if no broody is at hand, he will visit a few farmers for one, or let a friend hatch out the sitting of eggs in his incubator.

Many will mate up their breeding pens this month. Do not put too many females with the male; more can be added later. Keep

the males in fine condition, feeding them apart from the hens to ensure their getting sufficient food. Ducklings hatched this month will be ready for market at a time when prices rule high. Even the back-yarder can put down a sitting of duck eggs under a broody and fatten up the little ones for table. Owing to the frosty weather, collect eggs intended for incubation very frequently. For the same reason empty all drinking vessels overnight, and refill them in the morning; stir up the grit if it is frozen. See that the fowls have their warm morning mash very early, so that they do not have to wait about on cold, empty stomachs. The hens must have ample scratching exercise; bury a handful or two of wheat in the run overnight so that they will be busy scratching for every grain directly they leave the roosting-house. Give the drinking water lukewarm in the morning, so that it will not chill the birds after they have had their warm mash. Occasionally boil the evening grain and give it warm; if the corn is placed in a bucket of warm water and carried round the pens the grain will keep warm, and this method of feeding will help egg-production. To prevent the fowls from standing about idle after their warm morning mash, do not give too much of this, but make up by scattering a handful or two of corn in the litter of the scratching-shed or in the run.

Warm housing for the adult stock is essential, but avoid all draughts. Any cracks in houses should be pasted over inside the house, with several layers of thick brown paper. Use plenty of nesting material when preparing nests for broodies. A little condiment—one teaspoonful to every ten or twelve birds—mixed in the ingredients of the mash before they are scalded will help the birds on. Maize should be given in the evening grain in cold weather, and the fowls will appreciate an occasional morning feed of boiled maize—put on overnight. Do not force or over-feed breeding hens if fertile eggs are wanted. Some place a box well out of reach of the hens, but just high enough for the male bird, and into this is placed the cockerel's meal. It is a good plan to run two males to each pen, one being in charge for the first half of the week and the other for the latter half. The spare cockerel can be housed, if desired, in a cockerel-box left in the run. This will help fertility.

Every poultry-keeper should carefully examine his accounts for the previous year and make a point of avoiding any errors of that season during the coming one. The systematic breeder will have marked those males that were excellent early breeders the previous season, and now he will use those as against any that "came on" later. Only mate up hens that are laying, as non-layers will upset the breeding pen and make the male bird spiteful.

February.—This will be a busy hatching month. All Heavy breeds

should be mated up for March and April chicks. Eggs set after the 12th will hatch out in March, and these chicks when matured will lay by the following October or November. Exhibition chickens hatched out in March will come along nicely for the winter shows. Feed and care for the hens as in January, and see that they go to roost with well-filled crops. Feed all young stock by candle-light late at night to carry them over the long period of darkness ; the little chicks will soon get accustomed to such feeding and come out when they see the glow of the lamp. The hens will appreciate the shelter the scratching-shed gives, and eggs will be more fertile from hens in pens that are boarded up halfway than where only wire-netting enclosures are in use. All enclosures should consist of match-boarding at the bottom and wire-netting at the top to provide shelter from cold winds and prevent the males from fighting through the netting. Scrub out with warm water and thoroughly overhaul each incubator at the finish of the hatch.

Set plenty of eggs from Table breeds or crosses and keep all chickens growing. Mate up the breeding pens in Light breeds at the end of February and beginning of March.

March.—Eggs from both Heavy and Light breeds can be set this month for hatching out in April. March and April chickens in Heavy breeds and April and May ones in Light varieties make the best winter layers. Trade will be brisk in sittings of eggs and day-old chickens. Keep an eye on the young stock and on no account allow them to look back. Dust all broody hens with Izal powder before giving them eggs. More hens can be added to the pens now owing to the more favourable weather.

April.—This is an important month. The first duty of every poultry-keeper is to hatch out the stock he will require the next season. The wise poultry-farmer will keep half hens and half pullets on the farm, and so if 500 head of fowls are stocked he will want 250 pullets of the current year's hatching to replace the 250 hens he will under his system have to dispose of. It is always wise to allow an equal number of chicks as males, and so he will have to hatch out 500 chickens to get the desired number of pullets. Of course, if he proposes to sell stock cockerels and pullets in the autumn he will hatch out more, but I mention the above as far too many neglect to look ahead and ensure the success of the next season by hatching sufficient young stock. Once the hatching time passes over the breeder's head it will be too late to put things right. Let him, therefore, go thoroughly into the question of what stock is required to replace the old stock to be sold and be selfish in all things until he has satisfied his own requirements. By looking over the stock so far hatched he can put in more work this month as regards hatching if at all short of young stock.

Eggs from Heavy breeds should be set early this month for hatching in the same month—April—and eggs from the Light varieties can be set all the month for April and May hatching, although it is wise to get chicks out by mid-May. Keep the young stock growing and white-wash the coops (inside) when ready to take a fresh hen and brood. Regularly shift the youngsters to fresh ground, as at this time the grass begins to get rich and the chicks thrive thereon. Plant plenty of sunflowers in vacant spots, as they will be appreciated by the fowls during the moulting season. Set eggs from Bantams for April and May hatching.

May.—This is undoubtedly the best growing month for young stock, and the more they see of this merry month the better they will thrive. Keep the youngsters growing, separate the sexes of the earlier-hatched stock, and keep a watchful eye on ailments. Do not fall into the trap of late-hatching, or all the season's work will be thrown behind. *Under no circumstances* hatch Heavy broods this month, although eggs from Light varieties will be in order, as previously mentioned. Turkey and Geese eggs should be set this month, as the birds hatched will be in fine trim for Christmas.

Broodies will be troublesome this month, and the secret of curing this fever lies in the taking of it in hand *early*. Scores upon scores of eggs are lost each season to the poultry-farmer through his negligence in taking broodies in hand. Let him remember that whilst the fever lasts the hen is "out of profit"! In the case of exhibition hens or special layers that have had a heavy breeding season, no harm will be done if such birds are allowed to sit about on dummy eggs, for the rest will do them good. In each pen or enclosure a broody coop should be fitted up—large enough to hold four or five hens.

The coop should stand off the ground on legs, and a number can be put together very quickly and cheaply by *any one handy with tools*—a qualification *all* poultry-keepers should be able to boast of. The top, back, and two sides should be solid, but the front and bottom should consist of narrow spars of wood with spaces between. The object is to get a through current of air to cool the broody fever in the inmate. A door should be fitted to the front and the whole structure placed a foot or so off the ground alongside the house or scratching shed and within sight of the fowls in the enclosure. Into this coop should go all broody hens not required for the breeder's own use directly they go broody. It is useless to allow the hens to sit about for a few days, as the fever will only get a strong hold and prove difficult to break. Many are the suggestions given out by experts as to the best methods to employ to cure hens of broodiness, but for the most part they are useless. A method I have kept up my sleeve for a long time I now give as worth to my readers many more times the sum

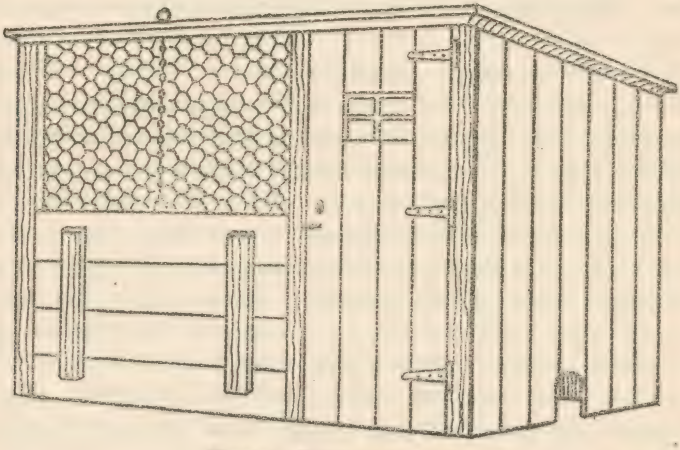
paid for this volume. *It is very simple, and is accomplished by placing a male bird in with the broodies.* Keep a few spare vigorous males for this purpose, and provided the hens are placed in the coop when broodiness is noticed, the above method will cure the most persistent Buff Orpington that insists on brooding a few potatoes—good nest eggs at other times—or a heap of round pebbles. The attentions of the Cockerel are too much for any broody hen! Do not neglect to feed and water hens well in the broody coop.

June.—Where hatching has been finished and the demand for eggs for sitting or chickens has died out, the breeding pens should be broken up. The males should be placed together in a large run and house ready for the coming moult. They will fight if the following precaution is not taken. Take a piece of stout string several inches in length, tie one end loosely on the male bird's right leg—above the spur—and the other end on the left leg. Treat all the male birds the same. The idea is to leave sufficient loose string between the legs so that the bird can walk comfortably, but not chase another male to bring his spurs into fighting position. Do not leave too much string between the legs, and tighten it up if it appears too loose, being guided by the bird's actions. After a few days of this the birds will shake down, when the pieces of string can be removed. There may be one hero who still insists on being "boss," in which case his legs can remain tied a little longer. After the pens have been broken up the male birds should wear distinguishing marks to show whether they have been good breeders—early or late in the season—judged by the percentage of fertiles from pens they headed. The owner will then know which to dispose of and which to use the next season, and when—in January or March. Never trust to memory!

Many poultry-keepers use cockerel-boxes in which to house their male birds after the pens have been mated up. A neat design for a cockerel-box is here given. The structure is a most useful one for farm-work, and measures about 4 feet long by 2½ feet wide. A perch is fitted inside and the floor is bedded down with litter. The exhibitor uses such houses very extensively, putting individual adult males therein over the moult. Sometimes two exhibition cockerels (friendly through being reared together) or two very promising pullets are placed in each box to await the time for them to go into the training house—with show pens all round—and be got ready for a certain show. Other boxes may be used to carry two adult hens over the moult. It is a common sight on an exhibition poultry-farm to see from thirty to fifty of these cockerel-boxes all grouped together. Where two males are run in each pen (as previously advised) the cockerel-box will come in useful to quarter the surplus male. The utility man will find these cockerel-boxes most useful in a score of ways, and during the rearing

season they may be used for young stock, being built on a larger scale if necessary, and the perches removed, as it is unwise to allow chickens to roost at too early an age for fear of crooked breasts.

Coming to the females, these must be gone through after the pens have been broken up. Place any that are to be sold in separate pens and group the others together, avoiding, of course, overcrowding. It is a good plan to build houses on the large size and with larger runs



USEFUL COCKEREL-BOX.

than is necessary, as one can then place more birds in the house and enclosure, and so rest the other runs. If the permanent house is on the small side but the run on the large side, place an additional house in the run.

Do not allow the chicks to be too long with the broodies; remove the latter as early as possible, as during the summer the chicks can keep themselves warm, and do not thrive if brooded too long. Place all broodies as they leave the chicks in a separate run, as each should yield a good basket of eggs after her rest. If they are placed with the other stock, the owner will sell them and lose very many eggs. The surplus birds—selected on results, etc.—must be sold to make room for the young stock, and the owner should remember that the longer he keeps them the heavier the weekly food-bill will be. Directly they drop off egg-production dispose of all the two-year-old hens it is proposed to get rid of, according to our plan of stocking half pullets hatched the previous year and the other half pullets of the same year's hatching. The wise poultry-keeper will sell some of these hens as he goes along, either with a dozen chicks each or as broodies. By so doing he will get full market value, for he can ask 5*s*. for a pure-bred mother or broody, whereas less would be received in the market for table purposes.

Those who can will make a speciality of selling a dozen day-olds with broody (surplus) hen at a reasonable price for the above reason. It does not necessarily follow that the hen must be the mother of the chicks, for by careful handling any *broody* hen may be enticed to take to a dozen chicks. Try the hen at night by candle-light, giving her one or two chicks to cuddle, and encourage them to run under the hen once or twice whilst she is sitting on the nest. If she calls them and seems quiet, more can be added, and the whole dozen left with her for the night. In the morning she will be found quite at home with her "foster" brood. A good plan, too, is to place the broody hen under a wire cage, and let her call the chicks through. By using a little patience she will in the end take the brood as her own. In each case scatter a little chicken corn near the hen so that she will peck up a grain or two and call the little ones to feed. The backyarder can buy a dozen day-olds, and by adopting the above plan entice an ordinary broody hen that has not been on eggs to take to the brood. Should the hen be spiteful at first, use the hand to shield the little chicks from the pecks of the broody whilst she is on the nest, and persevere until rewarded. Have above all things confidence in what you are doing.

Separate the sexes amongst the later-hatched broods, putting the males in one run and the pullets in another. This will give the latter a chance to grow, as cockerels are such greedy customers and have more than their own share of food. Market all surplus cockerels when ready; do not keep them on a week longer than can be helped; study the food bill *all ways and always*. With eggs cheap in price, take advantage of this by preserving all you can.

Tarring and whitewashing must be attended to whilst the weather is warm and dry. The exteriors of the houses and runs should be tarred and the interiors whitewashed. A mixture of creosote and pitch—three pounds of the latter to one gallon of creosote oil—makes a good preservative for exteriors. Put the whole together into an old pot and boil until the pitch has melted; add a little water if necessary. When thoroughly boiling it is ready for use. When applying it to the roof use a water-can, having first flattened out the spout until only a small hole is left. Pour the mixture over the roof until all is coated. All supports to houses and runs should be tarred, and if a sprinkling of fine sand is scattered over the roof when finished so much the better.

As regards lime-washing, here is a good recipe. Take ten pounds of lime, three pounds of soft soap, and one quart of paraffin oil. Place these ingredients in a tub and pour over about three gallons of water. Next place a coarse sack over the top of the receptacle to retain the heat and leave for a time. Stir the mixture and take out a bucketful

of the lime putty, thinning it down with boiling water. When it is strained it is ready for use. First give the house and run a good clean down inside and then do the whitewashing, using a well-worn whitewash brush. Dip the perches and also nest-boxes in the limewash. The perches and nest-boxes should be scrubbed down with boiling water and carbolic soap many times a year. Many poultry-keepers use a spraying machine, which naturally saves labour and is to be recommended where the work to be done warrants it. Where spraying is adopted no crook or crevice is missed. Creosote has become very popular of late, both for interior (in place of whitewash) and exterior use, and it certainly has everything in its favour.

Every poultry-keeper should take care of his poultry appliances, otherwise he will always be buying new accessories. Directly the hatching season is over collect all the coops, foster-mothers, etc., and place them under shelter till required the next season. It is ridiculous to leave them out in all weathers for nine months out of the twelve, as so many breeders do.

From my notes readers will see that there is plenty of summer work in the poultry yard. That is why it is so important that nothing should be left undone, but everything be attended to in season. The poultry-keeper will have the poultry-farm teeming with young stock of all ages—all requiring a little different treatment—and only by avoiding late-hatching and working along definite lines will he keep his house in order.

July.—By this month the young stock will be settling down into shape and any backward chickens should be especially dieted. The adult stock must not be overlooked. At the end of July the adult stock will commence their moult, and success or failure depends upon the owner. The casting of the feathers may take but six weeks under certain attention, but unless the hens are well looked after they may take many months to moult. If the winter egg-baskets are to be full the hens must be well over the moult and in their winter quarters by early October. If this is not seen to the birds will not lay till after Christmas. Laying should, in the poultry-keeper's own interests, be discouraged as the moulting-time approaches, and this can be arranged by withholding the soft food and not feeding the hens so liberally, or by a change of quarters. If the hens are allowed to contribute to the egg-basket they may be caught moulting when the cold weather sets in and will on that account discontinue casting their plumage. Not until the warmer weather sets in after Christmas will such hens come on to lay.

During the moult warm housing is essential, and when the feathers begin to drop the feeding should be increased. The males will require careful attention, for some will be wanted for early mating. Snugly

housed away from the hens and well fed, they will moult normally. Those who run a scratching-shed with each house will now find out the advantages that such offers. On wet and cold days the hens should be shut up from the grass run, only being allowed the use of the house and roomy scratching shed. Under this method they will soon cast their plumage, and if it can be arranged not to let the birds out into the grass run after two o'clock on the first three days of the week and before one o'clock for the rest of the week, this will help on the moult. Observe utter cleanliness in housing and regularly rake up the feathers in both house and run (or scratching-shed). The cleaner the surroundings the quicker the moult.

Give a pinch or two of sulphur twice a week in the soft food, and supply plenty of greenstuff. Sunflower seeds are excellent, as is linseed, the latter given in the mash. A little sulphate of iron in the drinking-water will act as a pick-me-up as, failing this, will Douglas Mixture.

Don't forget to gather in the hay when ready.

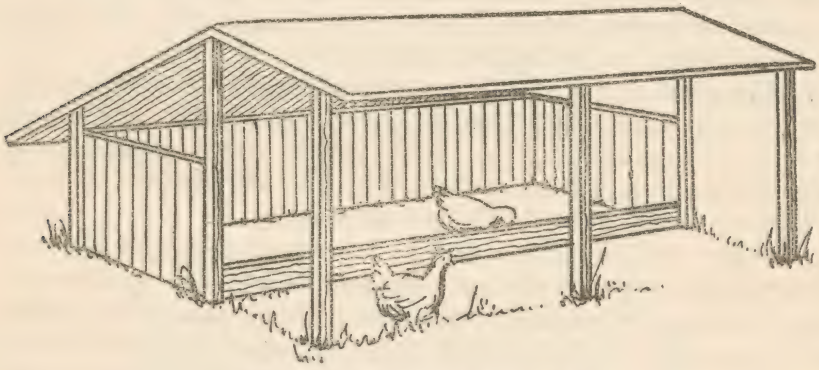
August.—Push the pullets along. Pay attention to any hens that are not moulting to satisfaction. Keep down parasites by observing utter cleanliness in housing. Keep the drinking water in the shade, and do not stint the young stock for ground space and fresh land to romp over. Run poultry-stock on the stubbles directly the corn has been carried.

September.—Make timely preparations for winter! See that all rain-gutters are in order, cover up draught-holes in houses, fix down loose sheets of zinc, etc. Do not allow any pullets to lay this month unless very early hatched, and therefore fully matured. A change of quarters and the withholding of the soft food for a time will throw pullets off the lay. The danger in allowing early laying lies in the fact that the young pullets will leave off when they feel the first pinch of cold weather and will not commence again till well after Christmas when the better weather sets in. After the moult give the birds a good pick-me-up. Attend to any wire-netting that requires mending, put a post here and there where deemed necessary, mend any doors, and do all to get the houses and runs into perfect order for the winter season, starting on October 1st.

October.—The pullets should be got into their winter quarters early, as any shifting later will put them off the lay. Do not force-feed the pullets, although certain well-known stimulants can be recommended. Eggs should come in plenty this month from well-grown, fully-matured pullets. Those who keep their hens on free range should construct scratching shelters, under which the hens can run for shelter during the winter months. I give a neat design for such a shelter, and the latter can be constructed very cheaply. The farmer can, if he wishes, thatch the top and sides. The winter show season commences just

now, and the exhibitor will be busy sending for schedules to the various secretaries. Poultry shows are advertised each week in the Poultry Papers. The Turkeys and Geese should be shaping well now, and any backward ones should be specially fed.

November.—The poultry-keeper will now reap the egg harvest he has sewn during the season. If he has been wise and followed the advice given in this work he should have plenty of eggs. Management will be on the lines given for January. Pains taken over housing,



USEFUL SCRATCHING SHELTER.

feeding, and management from now onwards will be well repaid in EGGS. Those who go in for early hatching will be busy mating up their breeding pens. The Christmas Turkeys and Geese should be put through a special course of fattening, thus receiving the finishing touches.

December.—Eggs from exhibition stock can be set this month to hatch out on January 1st—the earliest date chickens can see the light to be *legally* termed "hatched in current year." Some exhibitors, too, will be mating up their pens for January hatching. Those who propose going in for table chickens should set eggs this month and arrange for a certain number of eggs to be put down each subsequent week. December and January chickens will fetch excellent prices when ready for marketing. A general whip round private customers for Turkeys, Geese, or poultry stock for Christmas should be made early in this month. The market firms should also be written to, so that the stock that is being got ready for the Christmas trade may be "booked." Most of the notes given for January will be current for December.

CHAPTER XIV

Raising Table Chickens.

Poultry imports—Exhibiting table chickens—Chickens required—The plant—Methods of fattening—Killing—Plucking and stubbing—Shaping—Marketing the birds—Trussing—Petits Poussins—The value of feathers—Systems I know—Caponising.

THE raising of table chickens is a very profitable branch of Poultry Husbandry, and one in which there is ample scope for all. To the general farmer with much land at his disposal, it presents many opportunities, whilst to the poultry-farmer or Small-holder it should be looked upon as one of the best harvests of the year.

Our Imports.—We pay close upon a million pounds a year for table poultry, and but for the European War that total would undoubtedly have been exceeded in 1914. Below I give the values of poultry imports from 1912–14 :—

1912.	1913.	1914.
£845,565	£909,894	£755,263

There is an open market for all chickens poultry raisers can rear and there never was a better time than the present for one and all to engage in this branch of Poultry Husbandry, which, like "egg-farming," has been sadly neglected in the past. When war broke out I sent round to my clients, telling them to get their incubators busy early in December, as there would be a keen demand for table chickens in season 1915. Those who followed my plan as recommended had a long and profitable harvest, and as I was preparing these notes (as late as August) a letter from a client in Kent informed me that the Higgler was paying him 4*s.* 6*d.* per head for "half-fatted" table chickens. This price in August and from a Higgler speaks for itself. What would the producer have got had he marketed the chickens direct ? Six shillings, I fancy I hear you say !

A large firm in Leadenhall Market (London) reckons to pay annually to producers in Sussex, Surrey, and Kent no less than £20,000 a year for table chickens. I can state, too, on sound authority that one West End of London poulterer buys (and, of course, resells) from 300,000

to 500,000 table chickens a year. Can I say more as to the openings in this branch ?

Exhibiting Table Chickens.—Besides raising chickens many exhibit them (also eggs) at dead table-poultry shows. Where the producer goes out for a private high-class trade or sells stock birds the publicity obtained from winning the prizes counts for much. There is a "Table Poultry Club" that fosters the interests of this branch of Poultry Husbandry, and all engaged therein should become members. I give below the standard by which the exhibits are judged :—

	Points.
1. Size and quality	25.
2. Youth, quantity, and quality of breast meat	30.
3. Straightness of keel, fineness of bone, absence of offal and surplus fat	25.
4. General marketable appearance, colour of skin, etc. ..	20.

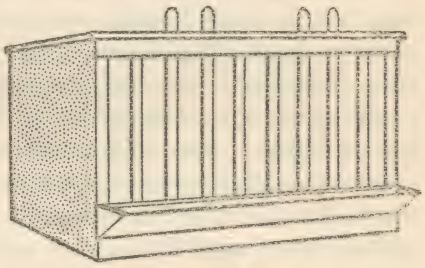
Chickens Required.—The best prices for table chickens run from April till June, although, of course, prices for well-fatted chickens are good all the year round. It is the spring chicken, however, that the producer must go out for if he is to reap tip-top prices, and to accomplish this early hatching is imperative. It is because of this early hatching that so many, not liking any extra worry or labour, do not trouble to get their chickens out and ready for the table early. Such persons ought not to be in the Poultry Industry, the membership to which is open only to those who are active and have more than a liking for work. Let us therefore go out for that which is difficult to get, but which pays for all labour and extra trouble when it is marketed, viz. the spring chicken.

The breeding pens must be mated up in November and December, and hatching commenced in earnest in December. A suitable quick-growing breed must be selected—I have dealt with this subject in the chapter on "Breeds"—and well-matured stock birds must be used. Select well-grown pullets that are in lay and mate to cocks that are over the moult and in breeding condition *or* hens in lay and well-matured, big-framed cockerels of the current year's hatch. The person engaged in this branch will, of course, look to all this long before the pens must be mated up, and will get any birds he requires for breeding into proper condition for early eggs and chicks.

The Plant.—The necessary plant will depend upon the number of chickens to be reared. Personally, I would like to see each reader plan to market 10, 50, or 100 chicks a week. If he allows for a 100-egg machine to hatch each week, this will give him a goodly number of cockerels to market each week when ready. The pullets are usually kept on for laying. The chickens would pass into the large brooder

house (elsewhere described), this taking them up to, say, eight or nine weeks. They would then have a run out on grass for, say, a fortnight, being housed in colony houses or cold brooders, when they would spend the next fortnight or so in the fattening crate. Thus the raiser would plan to have his chickens ready at from twelve to fourteen weeks old, when they ought to scale three or four pounds. The various steps will depend upon the quality of the fattener. If the birds are to be crammed, a cramming machine will be necessary, whilst shaping troughs to put the finishing touches to the chickens and peds to pack the chicks in for market will be necessary.

Fattening coops will be essential, and these should be 6 to 7 feet or so long, 20 inches deep, and 20 inches high. These are divided into three compartments by sliding divisions, from four to six birds being placed in each section. The front should consist of spars 2 inches apart, whilst the floor should be of spars 1½ inches wide and 1½ inches apart. Underneath this slatted bottom there should be a drop-board to catch the droppings, which, like feathers, should prove a profitable asset to the raising of table chickens. A wooden trough (movable) should be placed along the front of the coop to hold the food, no drinking vessels being needed, as water is not given to chickens that are being fattened up. With regard to the fitting up of the fattening coops, this will depend upon the number of birds to be raised or fattened each week. Where the person is engaged extensively in this branch special out-houses can be turned into fattening sheds. The coops should run all round the walls and up and down the centre, preferably in two tiers. They must be fitted to supports, of course to the height required. If made in sets, they can be moved out into the open in the summer.



FATTENING COOP.

For early work some such fattening shed is essential, and one must remember that the darker the place and the quieter the birds are kept the more weight they will put on. Where out-door coops are used, a nice shady walk should be selected, and the ranges of coops can be fitted on supports, to be three feet off the ground, a hood being fitted over the top to protect the birds from the rain.

Methods of Fattening.—When the time comes round the chickens —selected for their size and frames—after having finished their run through the brooder house and out-of-doors, are placed in the fattening crates. To create an appetite no food is given the first twenty-four

hours, and it is advisable to dust each bird with Izal powder to rid it of insects. A little grit should be given the first day or so, then discontinued. Sussex ground oats are used extensively for fattening, the method of preparation being to place the meal in a bucket, hollow out the centre, and pour therein skim milk. The mixture should be stirred until it has the consistency of stiffish cream. If the fowls cannot drag lumps of the food into the coops it has been well prepared. This (or any other food so prepared) is fed in the troughs twice a day, and at ten days old the birds are "half-fatted." About this time the birds go off their food and if not sold as "half-fatted" chickens they must be machine-crammed or finished off by hand-cramming.

In cramming by machine the food is slightly altered, a little melted mutton or beef fat being added, this being increased each day until ½ oz. per bird is given. The food is also made a little thinner. Cramming may last up to or beyond ten days, but when the birds are "ready" no extra food will put on weight. If it requires some pressure to get hold of the cartilage bones running from the sides of the backbone round to the vent the chicken is "ripe"; if the space between feels hollow fatten a little longer. It is quite simple to work a cramming machine and takes very little time when it has been mastered. Place the bird under the left arm, and grasp the head with the left hand, holding the tongue down with the fore-finger. Next pass the rubber tube attached to the cramming machine down the bird's throat (carefully avoiding the tongue) until the end is felt in the crop. The latter should be held with the right hand and the neck should be held quite straight when the tube is being fitted. All the operator has to do now is to press the pedal with the foot and take the latter off when the bird's crop is full. In giving the second meal of the day be guided by the amount (if any) of food still in the crop. Cramming machines can be purchased from any poultry appliance firm. With regard to hand-cramming, this is only possible where few birds have to be fattened. Have the food stiffer, so that pellets can be made, and these are gently inserted down the bird's throat. There are many excellent fattening meals on the market, and I have mentioned Sussex ground oats in particular, as that is the meal used extensively by Sussex fatteners of table chickens.

Killing.—Before killing, the bird should be fasted for twenty-four hours or so, as if any food is left in its crop or intestines the body will turn green. The common method of killing a chicken is by dislocating its neck. The operator takes the legs and wing-tips of the bird in the left hand with the back of the bird uppermost. The head is then taken between the first and second fingers of the right hand, the comb laying in the palm of the hand, and the fingers closing on the neck

close up to the head. The bird is placed across the operator's knee, and the neck is given a sharp long pull, the head at the same time being sharply bent upwards. Death is instantaneous if it is done properly.

There is, however, a still better way, and one most useful for larger poultry that really *take some killing*. Obtain a heavy piece of iron up to three feet long, and having placed the bird's head underneath, place both feet on the bar, one on either side of the bird. The legs of the bird will be grasped in the operator's hand, and a sharp pull will dislocate the neck instantly.

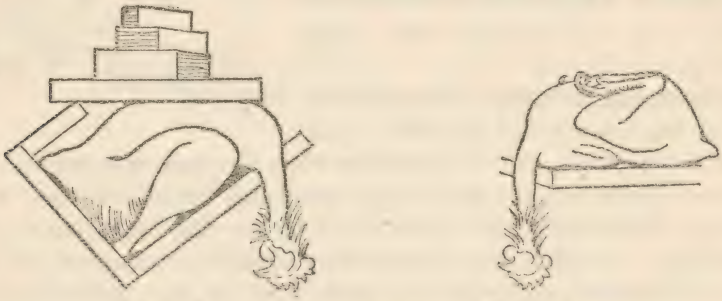
Plucking and Stubbing.—Immediately the bird has been killed plucking must commence, as the operation is simpler when the carcase is warm. The operator may sit in a low chair when plucking, holding the bird by its legs head downwards, or tie the fowls up to the ceiling and pluck standing up. In either case the operator should wear an apron and keep a receptacle directly underneath to catch the feathers. In plucking, the feathers should be pulled the opposite way to which they grow. The best method is to take the plucking in the following order: (1) breast, (2) neck, (3) back; (4) wings, (5) tail. Some scald the carcase first by placing it in boiling water for four or five seconds only. The bird is then suspended head downwards, and the feathers rubbed off with a towel.

Stubbing comes next. After the bird has been plucked, any stubs or growing feathers must be removed singly by means of a blunt knife and the thumb. All stubs should be removed to give the bird the best finish. Then comes singeing. All long hairs must be singed off by holding the bird over a gas jet and turning the carcase all the time holding it conveniently by the legs and head. Wipe off any pieces of black with a clean towel. Some use a screw of paper or a straw, but these are apt to smoke and blacken the bird. Wash the feet of the bird, and it is then ready for the shaping board.

Shaping.—We now come to the shaping. The fowl is placed directly after it has been plucked in a ⋁-shaped trough, breast downwards. Several of these boards can be nailed to supports, each below the other. When the trough is full, a board is placed on the backs of the chickens, and a few bricks or heavy weights placed on top. Each trough should hold about a dozen fowls placed closely together. Each bird, therefore, should be about the same size. Some producers flatten the breast-bone by giving it a sharp blow with a flat piece of wood and flatten out the parson's nose against the wall to make the bird fit nicely in

the trough. Keep a fly-proof muslin cover over the trough, and when putting the birds in the shaper press the legs up to the bird, also the wings, and do not remove the birds till they are quite cold. Sprinkle the birds lightly with pure white flour on their leaving the shaper, and then they are ready for dispatch to market.

Marketing the Birds.—There are several ways of disposing of the produce. In country places "Higglers" or collectors call round and buy lean, half-fatted or ripe table chickens alive. This is not the best method, although poultry-farmers like it because they have no trouble of plucking or killing. Circumstances must naturally carry weight.



THE SHAPING TROUGH AND ITS RESULT.

If the reader wishes to know what profit the Higgler makes, let him "higgle" by purchasing a pony and trap and calling on the local poultry-keepers, buying here, there, and everywhere, and putting the finishing touches to the chickens. The private customer is the best, of course, as top prices are made. The chickens will have to be trussed ready for table in this case, but no matter where the bulk of the chickens goes, foster and work up a good private trade. A pony and trap or motor-cycle will soon pay for itself out of the profits obtained through delivering eggs and table poultry direct to customers in the neighbouring towns. The local markets will take a few chickens—trussed or merely tied up—and can be supported.

Finally, we have the wholesale city markets, which must be patronised where table chickens are raised in goodly numbers. The birds are sent merely plucked and shaped to the wholesalers, who sell on commission, deducting this from the amount the produce marketed realises. Select a reliable salesman and never send up inferior stock. Grade the chickens into sizes, otherwise if they are mixed the price will drop. With each package enclose a note giving the weights, for instance, twenty-four fowls weighing four pounds to four and a half pounds each, and give the same particulars in any covering letter. Wednesday, Thursday, and Friday are the best days for dead poultry to arrive in the markets, and Wednesday and Thursday for live poultry

Some salesmen supply crates. Light crates that admit a little air are necessary to send the fowls in to market. Put a layer of straw in the bottom, then a layer of chickens with their breasts downwards, then follow with another layer of straw and chickens, and a top covering of straw. The birds must be packed tightly together to prevent rubbing and bruising, and the parson's nose should touch the side of the basket in each case. If the best trade is being catered for, place a sheet of grease-proof paper next the birds both top and bottom. In warm weather remove the intestines and insert a piece of white paper soaked in a very weak mixture of permanganate of potash and water, after squeezing out the liquid. Salesmen usually settle up weekly although many send cheques per return. If possible, come to London and interview the selected salesmen. Make all inquiries before doing business, and obtain references, or you may be disappointed, for there are "some" sharks that are still in the business.

Trussing.—There are many different ways of trussing a fowl, and these are fully dealt with by text and illustrations in any cookery book. For ordinary purposes trussing is not necessary, as the salesman's expert trussers will attend to that part of the business. However, where the poultry-keeper has a private connection, he will have to truss the chickens he sells. The best plan is for the reader to visit the nearest poulterer's shop and give the "expert" a tip to show him what A, B, and C mean in trussing. One method of trussing is as follows: Lay the bird on the table—breast downwards—pinch up the skin at the back of the neck and cut a slit with the trussing knife. Make the incision towards the head, two inches wide by three inches deep, to leave a flap to cover over the aperture left after the neck has been removed. Next cut through the bone of the neck about one inch from where it joins the body. Do not cut through the underneath skin, but having cut through the bone, pass the flat of the trussing knife upwards between the bone and the skin and cut off two inches nearer the head. The skin so left will pull over well down the back. The bird's feet should be facing the operator, and there should be on the table a plate for the giblets, etc., and on the floor a refuse receptacle. Throw the head into the refuse bucket and place the neck on the giblet plate. Peel the crop—a white skin bag, and pass two fingers down the neck-hole, loosening the lungs, and other organs. Fold the flaps evenly over the opening, the back flap coming forward and inside and the front flap being held in position by the wings, which are folded back to lie flat across the back, the flap being under them. Turn the fowl on its back and make an incision between the vent and tail-piece. Remove with the fingers all internal organs, not omitting the lungs. Throw all away except liver, heart, and gizzard. Cut a slit along the outside edge of the gizzard and take out the grit-bag.

To tie up take a trussing or packing needle some eight inches or so long and some white string. Place the bird on its back and press down the thighs towards the head and level with the table. Pass the needle and string through the fold of the leg right through the body and out between the fold of the other leg on opposite side. The wings are now spread out—the bird being turned on its breast—and closed up to the body, the small end-piece to each wing being pulled up and across the neck and shoulders where it clips and keeps in position. The same needle and string must now be passed between the bones of the second joint of the wing, then under and up through the skin of the fore-wing, which is folded back. The needle is passed on through the fore-wing and out between the bones of the second joint of the other wing. Tie the ends of the string together at the starting-point. The needle carrying a second piece of clean white string is next passed through the thigh bone of one leg right through the bird and out through the thigh bone of the other leg. The string is tied tightly over the thighs just below the hocks. Cut off the legs, and the bird is ready for the cook. To remove the leg-sinews, make a deep slit on the outside of each shank with the trussing knife, and twisting a skewer round each sinew, withdraw it.

Petits Poussins.—These are small chickens weighing but from six to eight ounces each at about six weeks of age. From April to June trade is good, and one lady-farmer has before now sold during Easter week over 800 Petits Poussins, obtaining 3*s.* 6*d.* per couple. A quick-growing breed must be selected, and white leg and flesh are essential. The chickens are often called "milk" chickens, as milk plays such an important part in their diet. Milk is given to drink as well as in the soft food. Oatmeal, middlings, barley meal, and boiled rice are good ingredients for the mash. Petits Poussins became a popular dish in society some twenty odd years ago, when a well-known Peer made these little "sprats" a speciality at his dinners. It is usual to serve out one chicken for each guest. America goes in for a larger chicken—called broiler—scaling twelve ounces. France and brave little Belgium have always had their Petits Poussins, and owing to the demand there for such dishes no supplies were exported to us.

The Value of Feathers.—The feathers must not be neglected, as they may be sold profitably to any of the firms advertising for supplies. The small feathers from the back, breast, and fluff are required, and must be kept separately from hard quill and tail feathers, or the mixture will fetch very little. Where possible, sort out into colours, keeping white from grey or dark. The feathers should be spread out on newspapers in a dry out-house, and afterwards hung up in bags through which the air can circulate.

Systems I Know.—There are many systems of raising table chickens on extensive lines. One method is to rear 50 chickens per week at a profit of 1*s.* per head *on an acre of ground.* The plant consists of three 100-egg incubators, 10 foster-mothers 12 feet by 3 feet, 14 cold brooders, 12 feet by 3 feet 6 inches, and sundries costing £102, and £50 is allowed for food, eggs, etc., for seventeen weeks before any chickens can be sold, making a total for capital of £152. For the first seven weeks the chicks are reared intensively in lots of 50 in the foster-mothers, and for the next seven weeks in cold brooders in lots of 25. The cold brooders are moved on 3 feet 6 inches every day to provide the chicks with fresh ground. One incubator is started on the same day each week, one foster-mother prepared for chicks each week after the first three weeks, and two cold brooders got ready after the first ten weeks. The eggs for the incubator are purchased. It is reckoned that each chicken will cost 1*s.* 5*d.* to rear to the table age, and bring in 2*s.* 6*d.*

There is, too, a system where the chickens are reared in flats. These chicken-rearing flats or pens are 6 feet long, 2 feet 3 inches high, and 4 feet wide, the fronts being covered at each end for 1 foot 9 inches to protect the birds from cold winds, thus leaving 2 feet 6 inches for the barred door. These flats are placed under cover two tiers deep, and sixteen chicks are placed in each flat or pen, from six to eight weeks old. The shed under which the flats are placed is open in the front but boarded at the back.

Mr. F. G. Paynter is well-known to Poultry culturists on account of his many practical "official" experiments with table chicken raising, and he has done more than any one to convince the poultry public that there is good money in this branch of Husbandry. His demonstration at Haslington Hall, near Crewe, under the auspices of the Board of Agriculture, created a deal of interest in poultry circles. Starting with *two* 240-egg, *one* 390-egg, and *one* 240-egg incubators, he hatched out his first chickens towards the end of December. From the incubators the chicks were moved to brooders under cover for the first week. At the end of a week the chicks were moved to larger brooders in the rearing field, these brooders being used for six weeks. Half-way through this period the batch average 120 chicks hitherto housed in two brooders, was divided amongst three brooders, each containing about 40 chicks. They were kept during the time they were in the brooders after this in batches of 40. At seven weeks old they were moved to larger wire runs (100 yards by 10 yards), and housed in what are known as Sussex * arks. Sixty chickens

* The ark type of house is a very old pattern, and has for ages been used in Essex, Sussex, and Southern counties for accommodating growing chickens. The present-day expert might smile at their construction, but they would naturally

were housed in each ark, and at the age of twelve weeks the number was reduced to 40, the remainder going into other arks. At sixteen weeks after date of hatching the chickens were ready for sale. In this experiment—four acres of land being set apart for the demonstration—the food bill amounted to £275, whilst the value of 3471 chickens marketed from the April to the following December was £496. The average weight of chickens when sold was 4·024 pounds, and the price per pound 8½*d.* The eggs for the incubators were purchased, and cost £80.

Caponising.—In America table cockerels are often caponised, their testicles being removed to remove sexual desires. Over here the plan is not extensively adopted, because I suppose chicken raisers have not troubled to master the simple operation. A caponised cockerel will grow to be a very large bird, and weigh much more than his brother at the same age. Caponising may take place at any age from three to six months, just before the birds begin to crow. The bird to be operated upon must be fasted for twenty-four hours at least to allow the intestines to be empty. A set of caponising instruments can be bought for 10*s.* 6*d.*, and full instructions as to their use are presented with each set. A good light is imperative. Tie the bird's legs together above the hocks, and suspend thereto a two- or three-pound weight. Place the bird on a small table, and tie a second piece of cord round the bird's wings close to the body, suspending a similar weight thereto. The weights will hang over the sides of the table and hold the bird in position and quiet. The bird's back should be towards the operator. Feel for the last rib—nearest the leg—and pluck a few feathers an inch or so below the back and directly over the last and last but one ribs. Damp the part to keep the feathers back. A cut about one and a half inches long is made between these two ribs, starting half an inch from the backbone. Do not cut too deeply, and sterilize the instruments before use. Next pierce the striffin—a skin covering the intestines—and the testicle will be seen. This should be gently removed by the "gripper," and the other testicle can be removed from the same side, although some repeat the operation after turning the bird over. Have confidence in what you are doing, and *practise on a dead bird before starting on a live one.*

be most useful for such work as above, as they are so light and portable and cheaply constructed. In appearance they resemble the child's toy ark, or a long dog-kennel, on a platform. The usual measurements are 6 feet long, 3 feet wide, and 2 feet 6 inches high, the ark standing on firm legs about 18 inches off the ground. The horizontal piece of framework (on each side) at the base of the ark and holding the structure up is carried out at each end for about 18 inches to form a handle so that the house can be carried to fresh ground easily. The floor is slatted to let the droppings through to benefit the ground, and half of the boarded front consists of a door on hinges.—AUTHOR.

CHAPTER XV

Ducks for Eggs and Table.

Ducks v. hens—Housing and management—Constructing artificial ponds—Feeding adult stock—Diseases of ducks—Hatching and rearing—Eggs and day-old ducklings—Exhibition duck culture—Breeds for eggs—Breeds for table—Fancy ducks—Raising table ducklings—Fattening for the market.

THERE is not a branch of Duck Culture that will not show a substantial profit at the end of the year, and yet so few farmers and poultry-keepers take any live interest therein. As is well known, Ducks quickly taint the land if the latter is over-stocked and not rested, but these precautions can be taken with very little trouble to the culturist. Those who have little accommodation at their command should treat the cult of the Duck as a side-line, but there is no reason why the man with from seven acres of land should not engage in the business on extensive lines. To the man who (1) rests his land, (2) avoids overcrowding both in housing and on land, and (3) starts with quality foundation stock, success should come. I can honestly say that there is a heap of money in Duck-keeping, and ample room for thousands wishing to take up the same on sound common-sense lines.

Ducks *v.* Hens.—Far too many are under the impression that Ducks lay very few eggs per annum. This is a mistake, for Ducks lay quite as many eggs as hens, and if their laying qualities were nursed and bred for, as will some day be the case, this member of the Waterfowl family would be a very keen rival of the domestic hen. Individual instances of heavy laying stand out in my mind as I write, and I give them as showing what the Duck can do by way of egg-laying. A friend of mine has had a trio of Khaki-Campbell Ducks average 256 eggs each in a year, starting to lay when four and a-half months old. The world's egg-record is, I believe, held by six Indian Runner Ducks which, in a test at the Hawkesbury College, New South Wales, laid 1601 eggs in twelve months. It is on record, too, of a Buff Orpington Duck laying 137 eggs in as many days. Ducks without the slightest doubt can, by breeding and selection, be persuaded to average 200

eggs per annum, and there is no reason whatever why the general farmer should not make a good yearly profit from a flock of laying Ducks. Some breeds of Ducks are great foragers, thus helping to reduce the food bill. Our climate, too, is moist, and so in every way ideal for the keeping of these Waterfowl.

I append a few reasons why Ducks should receive attention, as compared with hens. Ducks lay larger eggs than most hens; they are not prone to so many diseases; they remain "in profit" for six years, as against the two years or so of the hen; they do not scratch up the garden like fowls or fly over six-foot netting; their plant is not an expensive item, as they can be kept in bounds with netting eighteen inches or so deep; Ducklings are ready for the market sooner than chickens and yet make heavier weights; Ducks lay in spring, summer, autumn, and winter; broodiness is not so troublesome; eggs hatch better, and ducklings are hardier to rear. For the man whose surroundings are suitable Duck Culture should most certainly receive attention. Can I say more?

Housing the Adults.—The style of the house for adult Ducks will depend upon the nature of the surroundings. Some general farmers re-model an ordinary out-house to the necessary requirements, but to my way of thinking the day for housing poultry stock near the farmstead has passed. It is much better to spread them out on the land and let the latter benefit by their droppings, and the farmer by fuller egg-baskets. Up-to-date houses—well built and ventilated—are essential for all poultry stock. In constructing a house, see that it is rat and weather-proof, well white-washed within and painted without, and properly ventilated. A house 4 feet or 5 feet high and measuring 10 feet by 10 feet will house up to twenty Ducks, and to ensure dryness it is always advisable to fit a floor to the structure, and if necessary lift this a little off the ground. Ducks lay their eggs on the floor, and so bricks must be placed in each of the two corners opposite the door to leave a recess, which must be filled with straw to form a nesting-place.

Double-doors are advisable to such a house, these being fitted to swing open outwards, after the nature of ordinary coach-house doors. For the sake of ventilation, when the doors are closed a framework of wire-netting some six inches deep should be fitted above the doors for the whole length of the front. A hood can be fitted over this to temper down the wind. Along the back of the house at the top fit a similar wire-netting frame-work only about three inches deep. In the day-time these doors should be left open, and as on close summer nights Ducks require plenty of fresh air, it is wise to fit a wire-netting door inside the ordinary set of doors, so that the latter can be left wholly or partly open on warm nights, and the wire-netting will admit

plenty of fresh air and yet keep the Ducks in. Clean housing is essential, and the nesting material should be frequently renewed, as should the straw, which must be scattered on the floor of the house as bedding.

Is Swimming Water Necessary?—Plenty of people are under the impression that Ducks cannot be kept unless swimming water is provided. This is incorrect. Ducklings that are being fattened for table must be kept away from swimming water, as otherwise the exercise obtained would prevent them from putting on the necessary flesh. Stock Ducks, too, can be kept without swimming water, although I grant you that fertility is much better where the stock Ducks have a pond or stream to swim in. Where a natural pond is handy, such a house as described above can be placed near the water, and the Ducks shut up therein at night; they always come home to sleep. Failing a natural pond, an artificial one can be constructed if the owner so desires. Dig a hole of the size required—about 2 feet 6 inches deep—well ram down the earth, and cement the sides and bottom. On one side there should be a gradual slope, so that the Ducks can enter and leave the water on that side. Arrangements can be made for the water to be drained off when the pond can be filled up again with clean water. In the case of breeding stock, many build such a house as described above and add a wire-netting enclosure. The whole of the run is cemented down and a small artificial pond is constructed at the bottom. This cemented run is swilled down with water regularly and the liquid manure, etc., brushed down a drain at the bottom of the run, the latter having a slope for that purpose. The artificial pond is, of course, so built that the swillings do not go into the water. A number of these houses and enclosures are built in a long range and the adult breeding stock quartered therein permanently. The Ducks can, of course, have a run on the grass if necessary, each pen taking its turn. In the case of a range of permanent houses and runs, it will be advisable to build a large pond quite near so that the pens of Ducks can take their turns in having a run outside, and a swim. In the case of small ponds, the water can be frequently renewed and the cement well scrubbed.

Feeding Stock Ducks.—The method of feeding adult Ducks will depend upon whether they have free range or not. Ducks that have free range will naturally find a deal of their food, as will those that swim in rivers or streams. If they have such range or are kept for egg-production, they should be kept in a racy and fit condition and slightly on the hungry side to make them forage for part of their food. Prevent the Ducks from gorging themselves with acorns, as the latter will discolour the contents of the egg, making the yolk greenish, which turns black when the egg is boiled. Foods that ill-flavour the contents

of the eggs must not be given *in excess* if the eggs are required for market purposes. Onions, fish or fish-meal, must be given in reasonable proportions. Breeding stock must not be over-fed. For general purposes two meals a day may be given. In the morning give a soft mash composed of barley meal, bread, middlings, and house-scraps, with a little fish-meal (about 10 per cent.) several times a week. Sussex ground oats will make an occasional change in place of the barley meal, and on cold mornings it is wise to give the mash warm. At night give a grain feed of oats and wheat, with maize added occasionally in the winter. Feed the soft mash in troughs and scatter the evening grain in a pan of water. The grain can occasionally be boiled as a change. For confined Ducks green food is essential, but it should always be fresh. Plenty of drinking water and grit is essential, the grit being added to both drinking water and soft food. Observe utter cleanliness in both housing and feeding. Where the floor of the house is made of cement it can be regularly swilled and scrubbed down.

Diseases of Ducks.—Ducklings are very hardy, and diseases are in consequence very few and far between. Cramp will affect Ducks occasionally, but dry housing will supply the remedy. Should any Duck appear lame treat for liver trouble. Young Ducklings are subject to sunstroke, and should be shaded from the hot rays of the sun ; the drinking water should also be placed in the shade. A heavy storm will affect the Ducklings, so that it is a good plan to drive them under shelter when a heavy storm is approaching.

Hatching and Rearing.—Ducks usually lay their eggs in batches of from twenty to forty, having a little rest between each batch. Four or five Ducks can be mated to a Drake, the latter being easily picked out by his curly tail. When young the Drakes utter an odd shrill noise when the owner runs behind the flock ; the young Ducks merely quack. Ordinary hens are better than Ducks for sitting purposes, although, of course, they cannot cover so many eggs. Select large broody hens with ample fluff, and do not give them too many eggs to cover. Duck eggs invariably hatch out well and do not give so much trouble over "dead-in-shell," as hen eggs. Set a number of hens at the same time, and after testing the eggs for unfertiles, see that each hen has her full compliment of fertiles. The eggs take twenty-eight days to incubate, and should be damped a day or so before the Ducklings are due. Hens are usually excited when they hatch out Ducklings, so do not disturb the foster-mothers unduly. Feed the youngsters on bread crumbs and hard-boiled eggs, and give finely-chopped green food, grit, and clean water to drink *ad lib.* Early morning and late evening feeds are essential, and feed "little and often." Ducklings are soon ready to leave the hens, and weaning can take place two weeks

after they are hatched. The youngsters soon thrive and eat anything and everything. At nine weeks old sort out the wasters and fatten up for market. Any that are required for show must be fed for size and shaded to keep the plumage in good order. They soon thrive and at eight or nine weeks can have two meals a day—a morning mash and an evening grain feed. Place an up-turned cup in the drinking water whilst they are very young to prevent them from swimming, and cover the bottom of the drinking vessel with grit.

Eggs and Day-olds.—If a laying variety is kept egg-production should prove profitable. Duck eggs fetch excellent prices for edible purposes, and the demand is always keen. A friend of mine keeps over 300 laying Ducks, and pays several agents in the local town a commission on sales to display his eggs in their windows. He thus gets top prices and sells all he can supply, taking them round in a pony and trap to the agents. The latter, too, take orders for table Ducklings, day-olds, and stock Ducks. Quite a profitable local trade can be worked up for the eggs for table, and when hen eggs are low in price Duck eggs are in full season at high prices. They are ideal autumn producers. I have even known Ducks kept in back-yard runs for egg-production with profit. Those who are placed with a stream, canal, or river running at the bottom of the garden should find a flock of twenty or thirty Ducks very remunerative. The day-old Duckling trade is very profitable, and those who have the room can run stock birds and a few incubators, charging 6*d*. or 8*d*. per day-old. Excellent prices are paid for eggs for sitting by those who are engaged extensively in hatching out day-old Ducklings, and in season many advertise for sittings for this purpose. If a good flock of Ducks is kept of a suitable breed the owner can get rid of all his eggs at enhanced prices, especially if he can guarantee the day-old hatcher a good percentage of fertiles in the winter months. Then again there is the trade in sittings to individual customers.

Exhibition Duck Culture.—In recent years Ducks have become very popular for exhibition purposes, very big prices being paid for high-class "standard" specimens. Classes are provided for the various breeds at many shows, and the would-be exhibitor should start with a very select trio. Not long ago £100 was refused for four exhibition Aylesburys. As a side-line, the cult of the exhibition Duck is not to be despised.

Breeds for Eggs.—Breeds that are noted for their laying qualities may be given as (1) Indian Runners, (2) Orpingtons, (3) Khaki-Campbells. All are excellent foragers and a flock of either would put pounds per annum in the farmer's pocket. The White Runner is very popular, whilst the Orpington is bred in two colours—Buff

and Blue. The Khaki-Campbell has "Runner" blood in its veins. In egg-production "strain" counts for a lot.

Breeds for Table.—Aylesbury Ducks are noted for their immense size, hardiness and early maturity, and stand alone for table purposes in the eyes of many fatteners. The Pekin is a rapid grower, forager, and layer, and crosses well with the Aylesbury for table purposes. Aylesbury-Pekin eggs and day-olds are in much demand. The Rouen is noted for its table qualities and size, and crosses well for table purposes with the Aylesbury. Cayugas—a lustrous greeny-black in plumage—are prolific layers and deserve a good word for their sweet flesh. The Crested Duck is a noted layer and well deserving of support.

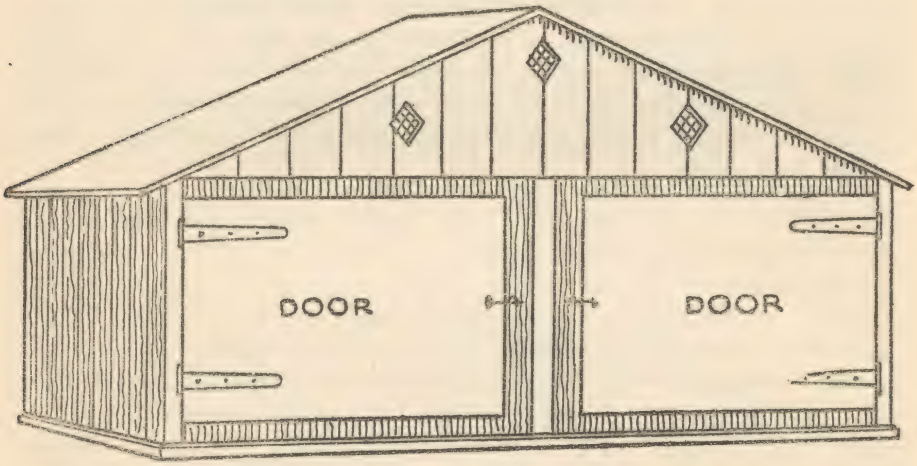
Fancy Ducks.—Any readers who live in the country and have lakes or ponds amidst natural surroundings will find much pleasure and amusement from Fancy Ducks. There are very many kinds to select from, chief amongst them being: Call Ducks, Carolinas, Mandarins, Pintails, Teal Ducks, Black East Indians, Northumberland Divers, etc.

Raising Table Ducklings.—The raising of table Ducklings provides ample scope for the man who has the accommodation. The county of Buckinghamshire alone supplies the London markets each year with £30,000 worth of Aylesbury Ducklings. In that county early in the year the chirp of the newly-hatched Duckling may be heard in nearly every room of the ducker's cottage. Best prices for table youngsters run from January to March, although they are good up to July; early hatching is therefore essential. In Bucks every cottager rears and fattens a number of Ducklings each year. Hens are used as broodies and orange-boxes as sitting-nests Some of the Ducklings are marketed at nine weeks old if ready, but it is deemed unwise to keep any on after twelve weeks, as they only lose instead of gaining weight after that age. At nine weeks old a Duckling should scale anything from 4½ to 5½ pounds, and at twelve weeks old as much as 6½ pounds.

As regards the breed, pure Aylesburys or Aylesbury-Pekin crosses are hard to beat for table purposes, as the youngsters of these fatten very quickly. To fatten feed the Ducklings every two hours for the first week, finely-ground barley meal, ground oats, and middlings making a good ration. Mix the whole to a crumbly state with milk. For the next three weeks five meals a day will suffice, when they can be given scalded biscuit meal, bran, middlings, and scraps. Four meals will do for four- to eight-week old ducklings, bran, middlings, greaves, and maize-meal being excellent. From eight weeks till ready for market three meals a day will be sufficient, Sussex ground oats, middlings, and greaves being given with a little melted fat added. Make full use of skim milk and meat liquor. Meat is excellent and nothing can excel fresh horseflesh where procurable. Clean water—and very

frequently skim milk—to drink, grit, and green food should be given *ad lib.* No swimming water is needed. Feed the Ducklings in troughs, well scrubbing the latter out at regular intervals.

Where but a few are being fattened they can be housed out in the field in flocks of fifty and reduced to twenty-five as they grow up. Ordinary houses bedded down with straw will do to accommodate them. I append a useful design of accommodation consisting of a low shelter divided in the centre by a wooden partition and with door to each section. Ventilation holes are made in both front and back at the top as it is essential that the structures be well ventilated. Several of these structures about 3 feet high may be placed in a large enclosure 25 yards by 25 yards. To make an enclosure use wire-netting



about 2 feet deep and as supports have ordinary stakes, passing them through the wire into the ground. When removing the Ducklings to fresh quarters merely remove the stakes and roll up the netting.

Many fatten their Ducklings under cover. A large house is necessary with a three-foot walk down the centre. Each side of the house is divided into sections to take the Ducklings at various ages, after the nature of a brooder-house for chickens. The lower sections take the ducklings from a day-old and at the end will be found those (eleven weeks or so old) ready for market. The sections get larger as the ducklings are older and are shifted up into them. They are divided off with boards about 18 inches or so deep, and outside grass runs are provided, these being judiciously rested to preserve them. The floor consists of concrete and is bedded down with straw. The house may be heated by means of hot-water pipes running through a hover as

in the Mammoth brooder-house for chickens previously described. About fifty Ducklings are quartered in each section.

Let us describe the plant of a large Duckling Farm. First there is the incubator room. The Ducklings when hatched pass into a nursery, which by means of hot-water pipes is maintained at a temperature graduated from 90 degrees to 75 degrees, the Ducklings being moved one stage along towards the cooler temperature every day. After the nursery comes the "Brooder," with a starting temperature of 70 degrees, and the progression from one enclosure to another goes on until the fattening sheds are reached. The age of the inmates of each pen is carefully noted. At seven weeks old the Ducklings reach the fattening house, which is divided into sections, each with an outer run. In the last compartment there is an artificial pond for the Ducklings to have a wash just before being killed for market so as to clean their feathers. The Ducklings are killed by means of a sharp knife passed through to the brain, and they are then hung up by the legs for the blood to drain. After being plucked they are placed in shaping boards and await the motor van to London. They fetch high prices.

CHAPTER XVI

Book-keeping on Business Lines.

Sales book—Expenditure book—Backyarders' accounts—Incubator charts—Sittings of eggs book—Temperature records—Chicken records—Egg-recording—Customers book—The stud book—Show records—On the slate—Publicity—The yearly statement.

POULTRY Culture is just as much a business as building, and book-keeping is quite as essential for the one as for the other. Only by the keeping of strict accounts can the true side of the business be shown, and any side-lines that are showing a loss be dropped. Every one is liable to make mistakes, but where accounts are kept they need only happen *once*. Many argue that they have no time to keep accounts, but this is ridiculous, for the entering-up need not take ten minutes or so each night, and once commenced book-keeping will make the owner take a keener interest in his poultry affairs. Simple records are advisable, and all should be properly filed away (for reference) under their proper sections when completed. No matter whether fowls are kept on the farm or in the back garden, the owner should keep strict account of all details connected with "expenditure" and "receipts." All side-lines such as Turkey-raising, day-old chickens, etc., should be kept separately, and the totals worked into the general account made out at the end of the year. If a friend should ask, "How much did you make out of your Turkeys last year?" you should be able to look up the details quickly and give the necessary reply.

The Sales Book.—A *general* sales book will be necessary where poultry-keeping is engaged in extensively. In this book everything sold will be booked up under the date of sale, such items to include fruit, hay, poultry, eggs for sitting, day-old chicks, stock birds, broodies, manure, feathers, etc. An ordinary ruled exercise book will answer the purpose, and the days of each month should be written therein. A page should be left at the end of each month, so that the totals of sales can be written down under the section headings, such as day-old chicks, eggs for sitting, etc. Then at the end of the year the monthly totals can be added up and compared with the totals in the books

especially allotted to these special lines. Where possible, put the names and addresses of purchasers and mode of dispatch, such details going under the end ruled-off section, headed "Remarks."

The Expenditure Book.—Another exercise book corresponding with the sales book, will be devoted to "expenditure," all items being entered up daily and the totals for each section or side-line worked out at the end of the month and carried over to the final yearly totals. Carriage on sittings of eggs should be entered up, and the name of purchaser should be given under "Remarks."

Sittings-of-Eggs Book.—A special note-book should be kept for sittings of eggs, and each page can be ruled (lengthways) into the following sections :—

Order received. Date.	Order dispatched. Date.	Customer's address.	Breed.	Amount due.	Amount paid. Also date.	Unfertiles returned.	Unfertiles replaced.	Further details.

Day-old chicks can have a special note-book on similar lines, and at the end of the book the cost of running the machines with the profit of each hatch can be recorded. It is a good plan to make out monthly totals in all accounts, as well as a final yearly grand total.

Backyarders' Accounts.—The small poultry-keeper only requires three note-books for (1) expenditure, (2) receipts, (3) record of eggs. The daily totals of eggs received should be entered up in book No. 3, the mode of selling them with amount going into No. 2 book.

Incubator Charts.—Records of the workings of incubators should be kept, as they tell so much at the end of the season. One can ascertain from such records which machines are the most reliable for early work and which males gave fertile eggs early in the season so that the best machines and males can be put "in harness" first the next season. Incubator charts should be sectioned off as follows :—

Number and name of incubator.	Pen number and breed.	Number of eggs set.	Date set.	Date off.	Clears first and second test.	Dead in shell.	Number and breed of chicks hatched.	Per-centage hatched.

Records of hatches by hens should also be kept, and a distinguishing ring placed on the leg of each reliable broody. Mating records should be kept in conjunction with hatching charts.

Temperature Records.—Those who are out to master thoroughly the question of artificial incubation will benefit by recording the temperatures (1) inside the incubators, and (2) in the incubator house two or three times a day. These charts may be pinned to the respective incubator charts. Notes on the moisture in the machine may be made occasionally.

Chicken Records.—One should always take stock of the chickens hatched—whether by incubator or hen. They should be entered up under the various breeds. All deaths should be recorded and particulars entered up as to the number reared to maturity. Even adult stock should be counted up very often as well as chicks and deaths noted.

Egg-recording.—The method to be adopted as regards egg-recording will depend upon the number of hens kept. Where trap-nesting is practised the charts are nailed upon the wall near the nests and the laying recorded on the spot, these sheets being taken into the house regularly for the details to be transferred into the stud or other book. A pair of scales should be kept near the trap-nests, so that the eggs can be weighed and their weights recorded. Egg-record cards, giving the number of pen, variety, and number of birds should be pinned up inside the door to each sleeping house and the eggs recorded thereon as collected, and the *daily* total filled in at the bottom. Indoors a big chart can be kept on the wall planned as follows :—

Pen No.	1	2	3	4	5	6	7	8	9	Total.
Breed ..										
Age ..										
No. of birds										
Additions										
Removals										
Returns ..										
Deaths ..										
Sold ..										
Jan. 1 .. „ 2 .. „ 3 .. „ 4 .. „ 5 .. etc.										
Total for month										

Total of birds..... Average..... Cost of food..... Value of eggs.....

A monthly summary of results is most useful, although where the poultry-keeper can only work out a yearly record this must suffice. The following items might be ruled off on the sheet :—

(1) Number of pen
(2) „ of hens.
(3) Breed and Pedigree.
(4) Total number of eggs laid.
(5) „ value „ „
(6) „ cost of feeding.
(7) Profit over feeding.
(8) Average number of eggs per hen.
(9) Highest „ „ for one hen.
(10) Lowest „ „ „
(11) Deaths, etc.
(12) Remarks.

Winter egg-record sheets will naturally carry more weight than those that apply to the summer months.

Customers Book.—A special book should be kept for the names and addresses of customers, no matter what they purchase, so that a catalogue of the farm's specialities can be sent to each the next season.

The Stud Book.—Those who line-breed their stock whether for eggs or feather must keep a stud book to know any bird's record. Headings like the following should be included therein :—

Legband No. or colour.	Variety.	Sex.	Date hatched.	Pedigree.	General remarks.

It is under "general remarks" that important notes regarding a bird's peculiarities, excellences, or weaknesses will be entered up. The breeder of heavy egg-producers will require to know his matings, and below will be found a suitable chart. The weight and colour of eggs should be recorded where heavy producers are being bred for, whilst "broodiness" must be recorded. Winter eggs count for more than summer eggs.

Pen No.	Breed.	When mated.	Sire's dam's record.	Sire's grand-dam's record.	Hens.						Remarks.
					1		2		3		
					Dam's record.	Grand-dam's record.	Dam's record.	Grand-dam's record.	Dam's record.	Grand-dam's record.	

Show Records.—Accounts referring to the exhibition branch of the farm should be kept distinct from others. A "general" book will be handy. Other books the exhibitor should keep include a show record book and a show diary. The former can be ruled off as follows :—

Date of Show.	Name of Show.	Entries made and cost.	Prizes won.	Name of judge.	What you think of him.	Prizes won and value.	Profit or loss.	Name, record and pedigree.

A show diary will be most handy where exhibiting is carried on extensively. Under the date of any show write the secretary's name and address, the amount of prize-money and fee, name of judge, and date entries close. At the end of the book start a judges' black list, marking any judges who are too fond of withholding prizes and mean in giving cards. If you do not exhibit Indian Game and find a certain judge always going for that variety in A.O.V. classes, "hall-mark" him for future reference. Prepare also a shows' black-list, marking any that pay half prize-money or take several months to pay out

prize-money. Support those shows with excellent credentials on future occasions.

On the Slate.—A slate should be kept hanging in the food-house, incubator-shed, brooder-house, etc., so that any important *reminders* can be chalked up. This will be better than trusting to memory. If a client wants a sitting of Minorca eggs by Monday chalk it up and don't disappoint.

Publicity.—Publicity is everything nowadays, so do not be afraid to advertise, but *judiciously*, of course. When a "home-bred" bird wins at the Palace, let the poultry public know at once. Go in for nicely got-up catalogues, using plenty of photo-blocks of birds and runs, and send all old customers copies. Tastily-printed egg and chick labels, fowl labels, memo-heads, circulars, etc., all spell business. Put the name of the farm and owner, together with the specialities, in bold type on every bit of literature sent out from the farm, including envelopes and postcards. Keep a separate account for printing, etc., expenditure, and "key" all advertisements, so that papers giving the best returns can be given extra space. At the end of the year you ought to know just what your publicity has brought in and the cost. Occasionally write to the Poultry Papers and keep your name and farm before the public. In dealing with any correspondence, remember that *courtesy costs nothing*. Be ever ready to help a novice, going fully into any questions he may ask.

The Yearly Statement.—A yearly statement must be made out at the end of each season. Some reckon the year as from January 1st, but it is better to let the season commence on October 1st and end on September 30th, thus starting with the winter egg period when the young stock come into profit. Receipts and expenditure may be taken as follows.

Receipts.				Previous year.			Expenditure.				Previous year.		
	£	s.	d.	£	s.	d.		£	s.	d.	£	s.	d.
Total for eggs ..							Total for foods ..						
,, ,, chicks ..							,, ,, poultry ..						
,, ,, poultry ..							,, ,, appliances						
,, ,, fruit ..							Cost of labour ..						
,, ,, hay ..							,, postage, etc.						
,, ,, manure ..							Other payments ..						
Other items ..													
Grand total ..							Grand total ..						

The live stock and plant must be valued at the end of each year, and the amount less that for depreciation set against the valuation for the previous year.

CHAPTER XVII

A Clean Bill of Health.

The hen hospital—Clean housing—Clean land—Clean feeding—Clean birds—How to make a post-mortem—Purchasing fowls—Diseases and how to cure them—The medicine chest—Medicines—Symptoms and what they denote—A tonic for general use.

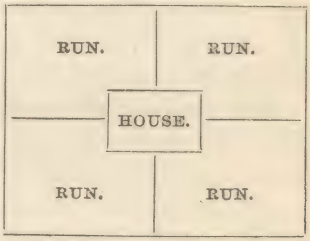
FOWLS, you will tell your friends after reading this chapter, are prone to many ailments, but let me say right here that 99½ per cent. can be cut out by common-sense housing, feeding, and management, and the other ½ cured if taken in time. Prevention is naturally better than cure, and the following are essentials if a clean bill of health is to rule in the poultry yard: (1) Clean houses; (2) clean runs; (3) clean fresh air in houses; (4) clean feeding; (5) clean incubators; (6) clean appliances; (7) clean broodies; (8) clean birds—interiors and exteriors; and (9) clean water to drink.

Clean Feeding.—This is all-important, and the advice given in the chapter on "Feeding" should be followed. Do not throw soft food on the ground, but use proper feeding troughs. The latter, too, should be kept scrupulously clean. Do not allow greenstuff to lie about the runs, and remove any food not eaten at any meal, or the fowls will lose their appetites.

Clean Housing.—See that all houses and structures admit plenty of fresh air without draughts. Well ventilate all structures and avoid overcrowding with stock. In a house that is well ventilated the air should not smell when the door is opened in the morning. The sun is the best germ-killer, and the houses should be so constructed that the sun's rays cover as much of the ground space as possible during the day. Make a second door (of wire-netting) to all houses, so that the wooden door can be opened wide in the daytime to admit fresh air and sunshine, whilst the wire-netting door will keep the fowls in. Whitewash interiors of houses and runs several times a year and at regular intervals take out the perches, nest-boxes, and other internal fittings and scrub them down with hot water and carbolic soap. Renew the nesting material very frequently, and sprinkle a little Izal powder therein. Keep the litter well raked over, and

renew it as desired. The soil in all earthen runs should be kept soft and scratchable, and it is wise to remove the top layer to a depth of several inches once a year and put in fresh mould. A little Izal or disinfectant fluid sprinkled occasionally on litter or soil will freshen it up. During the moult cleanliness in housing is essential, and bright environment just then will help the birds to moult the quicker and easier.

Clean Land.—Untainted land is essential for poultry-farming, yet so few farmers trouble to dress their land. Where the extent of the land is limited it is very foolish to rear chickens and run poultry on the same soil year after year without resting and cropping it. The dressing of soils is a very big subject, and every poultry-farmer should read a good specialist text-book on the question. It is unwise to use the same ground for chicken-rearing two years in succession, and some plan should be adopted whereby all runs can be rested and "cropped" when not in use. Much better results would accrue were duplicate runs allowed each house. The fowls could occupy one run whilst the other was resting and "cropped," and they could be turned into the "cropped" run when it was ready for them. Sheep could be allowed to eat down the crops, or they could be cut for the use of the fowls. It will, of course, depend upon what crop is grown. A good plan is to have four runs in one, placing a large house in the centre, as in the plan given. Any of the runs could then be rested as desired, the trap-doors leading to such runs being closed.



For young stock the quality of the herbage counts for much, for where it is poor then growth will be slow. Again, more poultry can be run on good-quality herbage than on poor; the hens, too, lay richer eggs. A strong growth of grasses and clover will prevent weeds from thriving, and so every autumn the poultry-farmer should think of improving his land. Such catch-crops as lucerne, alfalfa, crimson, red or white clover, white or black mustard, rape, rye, vetches, or tares, etc., are excellent. All land should be limed each year or every other year; ground chalk is a good substitute for lime. Basic slag cannot be beaten as a manure to bring out the finer grasses and clovers, and it should be used every other year, the autumn being the best time to scatter it over the land to bring on the next season's crops.

A reliable test as to whether the soil is sour or deficient in lime is by means of *blue* litmus paper. Get two pennyworth from your chemist, and having procured a sample of the soil, place the paper deep therein, leaving it for half an hour. If the soil is sour, the paper will have turned *red*, its depth of colour depending upon the

amount of sourness present. The dressing of land is a big question, but an all-important one.

When Purchasing Fowls.—One cannot be too careful with newly-purchased stock or fowls just back from an outing to a show. Such fowls should be placed in separate quarters and carefully watched for a few days to see that they are not ailing, when they can be placed with other poultry stock. Examine the inside of the mouth for any signs of roup or diphtheria, also the eyes and nostrils. If a bird shows unnatural breathing, or its breath smells, something is wrong. The excrement is a good guide to go by. If it is very white, kidney trouble may be suspected, if greenish or yellowish, then liver ailment—minor in the former case and serious in the latter. A perfectly healthy bird has a clean mouth and a firm red comb. If the latter is black or white, it is ailing. Fowls bought in local markets are more often than not suffering from some complaint, and they should not be placed with other fowls till the owner is satisfied as to their health.

The Hen-hospital.—A hen-hospital is essential on every farm if a clean bill of health is to be maintained. Any cosy, well-lighted out-house can be converted into a hen-hospital, and where one is not handy a special structure should be made. There should be two tiers of roomy wooden pens all round the room, the divisions being made of woop and all closed in except for the barred front, in which must be a door, and to which must be attached the drinking can and food receptacle. The front can be set on hinges to open for cleaning purposes. In the winter it may be necessary to warm the house so a little fire-place should be built in the corner, or hot-water pipes be run underneath the pens. In the house, too, there should be a medicine cupboard stocked with the popular and most needed remedies, also standard books on diseases of poultry, and a scrap-book for Press cuttings on ailments. Directly a bird is ailing it should be removed to the hospital and treated accordingly. Remember that it is by no means an *advertisement* for visitors if ailing birds are here, there, and everywhere when they call. Izal disinfectants should find a place in the medicine cupboard.

To Make a Post-mortem.—Should a fowl die, do not rest contented until a post-mortem has been held on its dead carcase. It is a simple matter to conduct a post-mortem. Place the bird with its breast uppermost on a table, nailing each outstretched wing and foot thereto. Pluck the feathers on the breast and cut the skin from throat to tail. Cut through the flesh on either side of the breast-bone and cut out the centre of the latter to expose the internal organs. If the liver is in order it will be a rich chocolate brown in colour, and firm to the touch. If it is speckled, discoloured, or soft, the liver is diseased. Coming to the heart, this should in a healthy specimen be firm and free from

excessive fat or small nodules of tuberculosis. It should be evenly "lobed" so that if it is empty on one side and distended on the other syncope or heart-failure may be suspected as the cause of death. Birds thus suffering suddenly drop down dead, and any such happening will act as the clue. The lungs—on either side at the back of the heart—are spongy-looking bodies and pink in colour. The "water" test is a reliable one here. Cut off a piece of one of the lungs and place it in a basin of water. If it floats it is healthy; if it sinks then unhealthy. Failing the discovery of any cause for death, the crop, gullet, and windpipe must be examined to see if there is anything unhealthy or wrong with them. The intestines must next be examined, and if the bird is a hen one may look for a broken egg or inflammation caused by some egg matter escaping into the cavity of the abdomen. Sometimes this egg matter will form into a very large ball resembling a large tumour, for which it is often erroneously taken to be. To examine the brain for any effusion of blood which would be associated with apoplexy or a fit, start at one side of the mouth, and with a pair of sharp scissors cut around the skull to the other corner of the mouth. Next lift the skull from the back, and the brain will be revealed. Tuberculosis and enlargement of the liver are common causes of death; in the former case the internal organs are covered with a number of small cheezy nodules. All birds that die, in fact *all* dead carcases, should be burned.

Diseases, and How to Cure them.—Below I give a representative list of diseases, etc., with recognised methods of curing the same. Half the battle in curing an ailing bird lies in taking it in hand directly its condition is noticed. There must be no delay, during which time the trouble can get a firm grip on the invalid. Remember: "Prevention is better than cure."

Anæmia.—Pale comb and face denote this; give strengthening tonic and food.

Apoplexy.—Brain trouble, usually due to breakage of small blood-vessel. Keep bird quiet in dark pen and give little magnesia in drinking water. Easily diagnosed by peculiar carriage of head.

Broken limbs.—If chick breaks a leg cut a quill down and slip it on. Then bind up. In case of adult bind up with calico soaked in plaster of Paris made the thickness of cream by use of water. Starch or white of egg will do as substitute. Do not bind too tightly after first wrapping or so, and ease the bandage if the leg swells. If a splint is necessary, use cardboard and not wood. The leg should be well in fourteen days, when wrapping can be removed.

Bronchitis.—Bird wheezes and has difficulty to breathe. Rub eucalyptus oil on beak and nostrils and give invalid eight drops of ipecacuanha wine in teaspoonful of glycerine three times a day.

Bumble foot.—Swelling under foot or toes, due to cut from broken glass or thorn or through heavy fall from perch. Poultice and lance with sharp knife—sterilized to avoid blood poisoning—then dress with boracic ointment and bind up. Give blood tonic.

Canker.—Invalid has yellow growth in mouth as in diphtheria: apply same treatment.

Catarrh.—Running at nostrils; treat as for roup.

Chicken ailments.—See Chapter VI.

Cholera.—Bird is dejected and very mopish, its wings falling to the ground and diarrhœa (green excrement) setting in. Isolate and house in dry out-house, giving four or five drops of chlorodyne three or four times a day. It is a most infectious disease, and to avoid an outbreak it is wise to kill any ailing bird. Burn all dead bodies and colour the drinking water with permanganate of potash. Disinfect and limewash all structures.

Cock-crowing.—Not a disease, but a complaint (neighbours'). Either put the crower in a basket at night, the receptacle not being deep enough for the bird to stretch its neck to the full, or suspend a heavy rod above the perch. Each time the bird crows the rod will swing and gently remind him—and quieten him—on its return.

Colds.—Common in spring and autumn. Avoid draughts in houses and overcrowding. Treat as for roup.

Combs.—Sometimes it is found advisable to remove a bird's comb, as the latter is so heavy that the bird cannot pick up its corn and would die if the operation was not performed. This is called "dubbing," and in certain Game birds it is generally practised where the birds are exhibited. The operation is quite simple, and the bird should be well again in under a fortnight. The legs should be tied, and where possible it is advisable to get the help of a second person. The comb is cut from front to back with a pair of sharp curved scissors, the operator taking care not to get too near the head, especially in the centre where the large vein is. Here it is wise to be three-quarters of an inch above the head. When performing the operation have every confidence in what you are doing.

Constipation.—Very common with chicks. Give castor oil and a little raw meat, anointing the vent with oil.

Consumption.—Bird goes light and wastes. Not worth a cure. Prevent it by breeding from healthy parents and adopting common-sense management.

Crooked breasts.—Due to allowing birds to roost at too early an age.

Crooked toes.—Chickens are often born with a twisted or deformed toe. Cut a piece of leather the shape of the toes and bind together with wool or soft binding. Release the pressure a bit if there is any swelling.

Crop-binding.—Food accumulates in crop, forming hard mass. Sometimes can be cured by holding bird with its neck extended and pouring down the crop half a pint of water, and working the contents of the crop soft. Then hold the head down and squeeze out the contents. Do things gradually and repeat the process several times. Often a dessert-spoonful of olive oil or half a teaspoonful of bicarbonate of soda in tablespoonful of water will cure it. Sometimes an operation must be performed. Pluck the feathers near the bottom of the crop and a little to the side, and with a knife make a slit in the crop sufficiently large enough to insert a spoon-handle. Remove the contents with the spoon-handle, well rinse out the crop with warm water, and sew up the aperture. First sew up the crop with greased white thread, the knot being on the inside, and then stitch up the outer skin. Smear the outside with carbolised vaseline. The trouble may be due to a long piece of grass or bacon rind the bird has swallowed.

Diarrhœa.—Give boiled rice dusted with powdered charcoal.

Down-behind.—Also known as "egg-prolapse." Common to heavy-producing hens, a part of the intestines protruding from the vent due to straining in laying a large egg or a number of eggs without a rest. Replace the intestines after lubricating them with vaseline. Keep the invalid quiet by herself, and withhold forcing food for a time.

Diphtheria.—Yellow growths in mouth or throat—ill-smelling breath. Remove the growths without causing blood to flow, and swab the parts (with a pencil that has some rag tied round the top) with a mixture of permanganate of potash and water. Isolate at once and burn all utensils used, as the disease is infectious. Make up a few dough pellets, one spot of creosote to each pellet, and give one morning and night. Keep the birds in the warm, and give nourishing food. Burn dead carcases and wash the hands in disinfectant after tending the birds.

Dropsy.—Enlarged flabby abdomen. Give stimulating food, and kill the ailing bird if not a valuable specimen.

Dysentery.—Invalid passes blood. Give charcoal in soft food and keep the invalid short of food for a day or so.

Egg-binding.—Unable to pass large egg ; invalid frequents the nest continually, straining to get rid of the burden, carrying tail low. The egg will be felt near the vent. Hold the fowl's vent over a bucket of boiling water for twenty minutes, when the steaming should release the egg. Lubricate the vent with olive or sweet oil, and give a tea-spoonful of castor oil. Take great care not to break the egg ; if that happens get all the pieces of shell out to prevent inflammation.

Egg-eating.—Most annoying vice. Usually caused through the nest not being well-lined with hay, and an egg getting broken. A remedy is to blow an egg and fill the shell with prepared mustard,

leaving this dish in the nest. Give the hens plenty of grit, as soft-shelled eggs may start the vice. If the culprit can be found, kill her if she is not valuable, as the habit is picked up quickly by all the birds. Nests are sold where the egg drops through a hole in the centre of the nest when laid, and so passes out of reach and sight. Place the nest-boxes in the dark.

Eggs (soft-shelled).—Supply plenty of grit and shell, and do not feed the hens on too nourishing a diet. Too much soft food will often cause this trouble.

Enteritis.—Invalid has great thirst. Yellow diarrhœa and similar symptoms to cholera. Isolate and treat as for cholera. Very infectious; burn all bodies.

Feather-plucking.—Abominable vice and soon spreads amongst a flock of fowls. Due to lack of exercise, overcrowding, or feeding too-heating a diet. Give plenty of greenstuff and Epsom salts in the drinking water. Bathe the affected parts with quassia water—quassia chips being soaked in boiling water—and well rub in a mixture of sulphur and lard. The best remedy is to find the culprit—always the bird without a feather out of place—and kill her.

Frost bite.—In cold weather Minorcas, etc., are liable to suffer from frost-bitten combs. The latter turn dark and shrivel up. Keep the birds warmly housed and apply vaseline or camphorated oil to the comb. During cold weather all heavy-combed non-sitters should be warmly housed and protected from winds. The males—reserved for breeding—can be housed in a warm out-house and only allowed out on fine days.

Kidney troubles.—White excrement, ruffled plumage, thirst, etc. Give powdered charcoal in soft food, and feed on nourishing diet.

Liver ailment.—Green (minor) and yellow (advanced) excrement, loss of appetite, dull, purple comb. Give Epsom salts and eight drops of rhubarb tincture in teaspoonful of glycerine morning and night. Feed on nourishing diet. Usually advisable to kill in serious cases, and burn the bodies.

Moulting.—Oily foods necessary—sunflower seeds, stewed linseed, etc. *See notes elsewhere.*

Pale yolks.—Due to insufficient supply of green food.

Parasites.—Of insect pests the red mite is undoubtedly the most troublesome. It is seldom seen in the day-time, preferring then to hide away in some crevice in the house and coming out to attack the fowls at night. They are blood-suckers, and once allowed to take possession of the roost the inmates will suffer greatly. They crawl along the perches and get on the birds, sucking their blood until daylight comes along, when they retire and come again the next night. Once they get the upper hand it is hard to apply the remedy, for

even if the perches do not touch the sides of the wall, the pests will crawl along the roof and drop on to the backs of the fowls as the latter roost. Wash all perches and nest-boxes with Lifebuoy soap, and keep houses clean and whitewashed. Regularly disinfect the house by closing all outlets after releasing the birds and lighting a bucketful of brown paper. Place the bucket in the middle of the house. A lighted sulphur tablet will serve the purpose, these being used by the housewife for disinfectant purposes. The fowl louse is a bright orange colour, but does not live on human beings, as many suppose. It can only live for about a day if parted from the hens. The hen flea multiplies in dirty houses, taking up its abode in nests, etc., and rarely on the hen. Insect powder should be used on birds and nesting material. Ticks are found on the heads of chickens, and carbolised vaseline should be well rubbed in, care being taken to see that none gets into the eyes. Birds that are in poor condition are usually the victims selected. Keep the houses well lighted and clean. *See also* "*Scaly legs.*"

Peritonitis.—Inflammation of the oviduct. May be caused by an egg breaking inside the hen.

Pip.—Usually associated with colds or fever, the bird breathing through the mouth on account of obstructed nostrils. The skin of the mouth and tongue becomes hard and dry, a horny skin developing on the tip of the tongue. Moisten the tongue with glycerine and water (equal parts) until substance loosens. Help matters by lifting up with a sharpened match-stick, but bleeding must be avoided. Give powdered charcoal in the soft food.

Pneumonia.—Invalid coughs and can only breathe with difficulty. Constantly visits the drinking water and loses appetite. Isolate and house in warm structure. Give five drops of ipecacuanha wine in teaspoonful of water four or five times a day, and feed on nourishing diet—bread and milk, Bovril, or beef tea.

Poisons.—In the fields there are scores and scores of poisonous berries, seeds, and flowers, but birds on free range do not touch them, as a rule, owing, I suppose, to the fact that they have ample green food at their disposal. It is usually the fowls in confined runs that devour such poisonous plants, owing, I expect, to their being ever ready to devour greenstuffs. One should be very careful in giving the fowls garden trimmings, etc. A little does not do harm in many cases, but confined fowls are apt to take their fill of such things ; hence the danger. Laburnum seeds will poison fowls if they take them in excess. As a rule, there is no cure, as the bird dies suddenly before symptoms tell the poultry-keeper something is wrong. Prevention is better than cure, and when a bird dies from poisoning look into the matter and safeguard other fowls by removing the cause of the trouble. Never leave rat poison about the runs or houses.

Quill-bound.—Young stock and birds in the moult are occasionally troubled by quill-binding—the feathers being retained in the sheaths. Give the invalids a good warm bath and loosen the sheaths with the thumb nail. Give flowers of sulphur in the soft food and a tonic in the water. If a bird is given a warm bath just before the moulting period it will hasten the moult.

Rheumatism.—Treat as for cramp, dipping the legs in a hot mustard and water bath, and afterwards rubbing in turpentine.

Roup.—A neglected cold will result in roup, so take all cases of common colds in hand at once. A watery discharge from eyes and nostrils, accompanied by sneezing, will denote a cold. Bathe the eyes and nostrils with weak solution of Condy's fluid and warm water, adding a little of the former and a tonic in the drinking water. Isolate the invalid at once, removing it to warm quarters and give a teaspoonful of glycerine and milk—warm—two or three times a day. Feed on nourishing diet—Bovril, beef tea, bread and milk, etc.

Scaly legs.—These are an eye-sore, and are caused by parasites. Besmear the legs with tar or creosote, taking care to get none on the bird's plumage or flesh. Place the bird in a pen until the tar dries. This is the best remedy. Never set a broody hen that has scaly legs; cure her first. The exhibitor must take great care of his exhibition birds' legs. Birds on grass range keep in good condition, but exhibition birds in confined runs will benefit by having their legs washed once a week. After drying them rub in a little olive oil. Scratching amongst damp straw will burnish yellow or black legs, whilst white legs should be rubbed down occasionally with zinc ointment. Never apply too much friction to white legs, or they will turn reddish. Very few are aware that birds moult their leg-scales as well as plumage when they moult. Help the birds by pressing the thumb-nail against the sides of the old scales to make them drop.

Skin diseases.—Zinc ointment is good for skin eruptions, whilst sulphur should be given in the soft food.

Slipped wing.—Usually the wing-feathers get crossed through a fight (although sometimes hereditary), or through a heavy bird hustling a lighter one at food time. Wrap a wide piece of tape once or twice round the wing, and tie round the shoulder or sew the tape to one of the quills to keep the wrapping on. Generally all right in a month.

Small-pox.—Small dark sores on head and under wing. Isolate and give sulphur in the soft food and a tonic. Rub carbolised oil on scabs.

Soft bones.—Sometimes a bird will suffer from soft bones, the joints decaying. Useless to treat, so kill the bird and bury the carcase. Hereditary.

Spurs (to remove).—In the case of a spiteful male bird or where the

long spurs are a hindrance to a bird, these weapons should be removed. The operation is quite simple, and *there is no pain attached to it.* First place the spur through a piece of damp cloth, and with a penknife make a little cut all round the spur—on the horn side, but as near the leg as possible. Now push a hot baked potato right on to spur and allow it to remain there for a minute or two. Next remove the potato, and with a sharp movement, break off the spur. If the operation fails, cut a deeper circle in the spur near the leg. Once the spur is off, level down the remaining part of the horny substance with a red-hot poker. Many, indeed, use a red-hot poker for the whole operation. Sometimes a male bird will make a gash in the side of the hen when treading her, so that the spurs are best off in such cases.

Staggers.—Common to young ducklings. Caused by the invalid getting hot and drinking a lot of water. Keep drinking vessels out of the sun and provide artificial where there is no natural shade. Keep invalids quiet and give cooling medicine, such as magnesia.

Surgery.—To treat cuts or open wounds first wash the hands. Next remove the feathers around the wound and cleanse the latter with warm water. Where the wound (if a large one) requires a few stitches, use a needle and silk (both previously sterilised). If the wound goes through muscles as well as outer skin, sew each up separately. Paint the skin near the wound, but not the latter itself, with diluted tincture of iodine, and powder the wound with iodoform. Having put in the stitches smear the outside with vaseline and put a bandage on if severity of the wound calls for same.

Tuberculosis.—Attacks adult stock, seldom chickens. Once the bacteria gain entrance to the bird's organs they there multiply, small nodules or tubercles forming on the organs. Practically useless to treat. Kill all ailing birds, as the disease is infectious, and by healthy birds picking it up a whole flock may suffer.

Vent gleet.—Redness and incrustration; ill-smelling. Handle such birds with care, washing hands in disinfectant after treating the invalids. Soak off incrustration with warm water and disinfectant fluid, and dress with zinc ointment. Give the bird Epsom salts for a day or two.

Vertigo.—Bird runs in a circle. Treat as for apoplexy.

Wattles.—When wattles swell and harden, suspect dropsy of wattles as associated with roup. Bathe the wattles with hot vinegar, and if swelling is still there lance the wattles at lowest part, and remove any matter. Afterwards rinse with weak solution of permanganate of potash.

White comb.—White crusts on comb, spreading over body. Bathe affected parts with hot vinegar and water (keeping it out of the eyes), and anoint with vaseline. Persevere.

Worms.—Sometimes seen in excreta of fowls and should be looked for in cases of diarrhœa. Give two grains of Santonine in spoonful of warm water, and failing this, six drops of oil of male fern in teaspoonful of castor oil, previously starving bird for twenty-four hours. Collect and burn all litter and droppings. Give warm milk and water to drink after dosing the bird, and keep an eye on the droppings of other birds in the pen.

Wry-tail.—A deformity. Although illegal from exhibition point of view, it can be cured by the ligaments on the other side of tail being severed by an operation, and tail thus balanced. If a tail is carried high a piece of lead is tied to it until it is carried at the correct angle.

The Medicine Chest.—All poultry-keepers should fit out a medicine chest or cabinet, no matter whether a dozen or a thousand birds are kept. In the chest should be kept all the popular remedies for general use, and the bottles should never be allowed to run dry. Several rolls of bandages should also be stocked. Below will be found a list of medicines with their qualities :—

Boracic acid powder.—Good for cuts and wounds. Lotion : tablespoonful of powder to eight ounces water.

Boracic ointment.—Dressing for swollen faces or eyelids, comb-troubles, etc.

Castor oil.—Liver troubles, diarrhœa, etc.

Charcoal.—Invaluable to correct stomach troubles.

Chemical foods.—Any used for human beings are good for weak birds.

Cod liver oil.—For colds, roup, general weakness, leg-weakness, etc.

Creosote.—For scaly legs, diphtheria, roup, diarrhœa.

Epsom salts.—Most inward troubles, liver ailments, giddiness, etc.

Flowers of sulphur.—Blood medicine, diphtheria, skin troubles, give in mash.

Friar's balsam.—Will stop bleeding, for use after dubbing a bird, for cut wattles or combs.

Glycerine.—For dressing combs, for roup with milk, use with care for dressing.

Iodine (*tincture of*).—For painting swellings, etc.

Iron (*sulphate of*).—Useful as tonic in drinking water.

Olive oil.—Useful for worms, good exterior and interior lubricant.

Permanganate of potash.—Condy's fluid, excellent disinfectant.

Rhubarb (*tincture of*).—Good strengthening tonic.

Soda (*bicarbonate*).—Good for liver trouble, sour crop, etc.

Vaseline.—Excellent for dressing sores, etc.

Zinc ointment.—Useful for dressing sores, etc.

Tonic for General Use.—Where several hundred head of stock are

kept a tonic for general use such as the Douglas Mixture will be most useful. To a gallon of water add eight ounces of sulphate of iron, and when dissolved one-half fluid ounce of diluted sulphuric acid. Allow the mixture to stand, and when clear place it into convenient-sized bottles. To administer to adults give a teaspoonful to a pint of drinking water. During the moult, before the pullets commence to lay, after a heavy breeding or laying season, for growing youngsters, it will be found a good stock tonic and conditioner.

CHAPTER XVIII

Geese, Guinea-Fowls, and Turkeys.

Breeding—Feeding—Hatching—Rearing—Fattening—Housing—Management, etc.

ANY book on Poultry Culture would fall short of its mark if it omitted reference to Geese, Guinea-Fowls, or Turkeys. The cult of either of these will prove very remunerative, but surroundings and circumstances must be considered. Those who take up the raising of Geese, Guinea-Fowls, or Turkeys should treat the same as an asset or side-line to other farm or poultry work, and if they proceed on common-sense lines they should be the richer by many pounds at the end of the year. It is always advisable to keep special accounts for either of these side-lines, so that the owner will know exactly what his profits are at the end of the season.

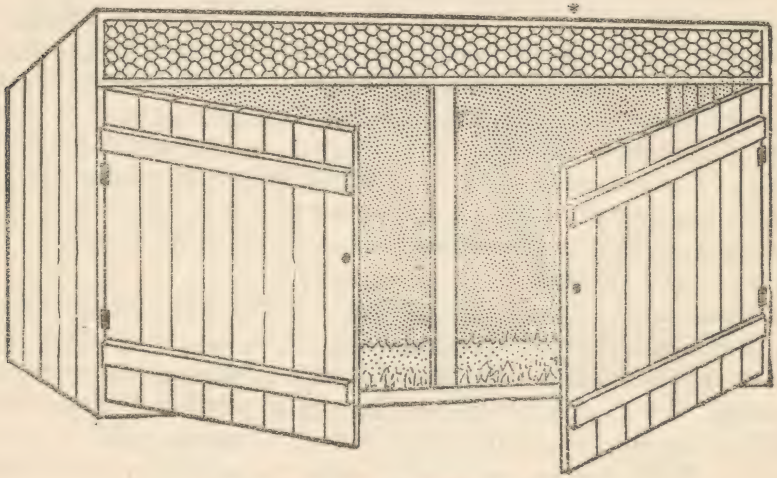
Geese.—Any one—whether Small-holder, farmer, or "commoner"—who has any waste land should hand it over to a flock of Geese. The latter thrive on poor grass land that is unsuitable for other stock, being capital grazers and foragers. Where stock Geese are kept they will live to a good age, find a quantity of their food, and yield good profits. The *modus operandi* is to keep the stock birds on and rear Goslings each season from the eggs laid, fattening them up for the market. It is on record that as many as one hundred and twenty Goslings have been reared in one season from three Toulouse Geese mated to an Embden Gander. The advantages of the cult lie in the fact that (1) one need not keep a large flock of Geese all the year through, a trio or two of breeding stock furnishing the rearer with sufficient Goslings; (2) there is no need to reserve the best field or land; (3) Geese make themselves at home on "commons," where there is rough pasture and a little swimming water; (4) where surroundings allow they "board" themselves; and (5) the stubbles can be utilised after the corn has been carried.

Geese are easy to manage and can be fed on the same foods as recommended for Ducks, with which they go hand in hand. Many of my readers are fortunately placed with a stream, pond, or river at hand, and a little rough pasture or waste land near. To such should

Geese appeal, as the birds are wonderful foragers and will go out and find most of their food when let out in the morning. As regards their feeding, due allowance must be made for the amount of food the birds are likely to get off their own bat. Geese begin to lay in February and yield most of their eggs by May. There is ample scope for this side-line, which unfortunately has not so far received the attention it deserves. In 1908 a census of Geese was taken for Great Britain, and in 1912 a similar one for Ireland. I append the figures—representing the breeding stock of Geese in the United Kingdom :—

England	172,000	Scotland	12,000
Wales	69,000	Ireland	456,000

As regards the housing of Geese, dry, well-ventilated structures are essential. Sometimes it happens that an out-house may be remodelled to suit, but special accommodation is best, and I prefer one after the description given in the chapter on "Ducks," a drawing of which appears below.



USEFUL HOUSE FOR GEESE.

This consists of a low structure with "coach-house" doors. The floor is bedded down with straw, and nests are made in the corners. Above the doors for the whole length of the front is a wire-netting framework for ventilation purposes.

As regards the rearing of Goslings, the eggs take thirty days to hatch and may be entrusted to either a hen or to mother Goose. The latter will cover ten or twelve eggs, and the former four or five, according to her size and amount of fluff. A Gander should be mated to three Geese. In feeding the Goslings use all the house scraps and make play

on the foods recommended in the chapter on "Ducks." An abundant supply of grit is essential, and the feeding vessels must be kept scrupulously clean. Goslings require plenty of grazing, and for the first week must not be allowed to roam from their mother. Pen the latter up for the first week. "Green" Geese are those fattened up for market when from eight to ten weeks old, three weeks or so being devoted to the fattening process. At Michaelmas and Christmas the demand for table Geese is very strong. Boiled rice, ground oats and middlings, with a little maize-meal and barley-meal occasionally, or as a change for ground oats will make a good fattening meal. Melted fat, skim milk, or meat liquor can be added occasionally. Give the soft food in troughs, and the grain feeds in a pan of water; as a change, boil the wheat, oats, and maize.

There are, generally speaking, four varieties of Geese: Toulouse (or Grey), Embden (or White), Chinese, and Roman. The Toulouse lays up to fifty eggs or more in a season, and are not given to excessive broodiness. The Embden grows quickly, is a good sitter and layer and crosses well with the Toulouse females for table purposes. It lays two batches of eggs and should not be allowed to go broody till the second batch has been laid. The Toulouse has a keel, whereas the Embden is keel-less. The Chinese can be distinguished by the knob at the base of its bill. A good layer and quick grower, it crosses well with Toulouse females. It is bred in two colours: Grey and White. The Roman Goose is an excellent layer and grower, and has recently come to the front on account of its sweet flesh. Not many specimens are kept in this country as yet, but that its merits will win a name for it I am sure.

Guinea-Fowl.—One of the prettiest yet quaintest members of the World of Poultry is the Guinea-Fowl. This handsome little fowl should appeal to all farmers, for it is an excellent layer, practically "boards" itself, and fetches excellent prices for table when spring chickens are scarce and the game season is closing. The hen lays anything from fifty to one hundred eggs in a season, and of course by special breeding this could easily be increased. The eggs are large and rich, the hen starting her output about February or March. The plumage is a slate or grey ground, beautifully spotted with white round dots, although, of course, the pure White variety is bred. The flesh has a "gamey" taste. The Guinea-Fowl makes an excellent guard, uttering a peculiar note (sounding like "come back" or "come Frank") when disturbed. They are weather prophets too, for on nights that foretell of wet weather ahead they roost in the lower branches of trees. On other nights they will be found on the top branches. Although they prefer to sleep in the trees, they can be trained from chicken-hood to feed and sleep with the other fowls.

Their habits are unique and most interesting to watch and study. They lay their eggs in out-of-the-way places—in the hedge-row or a bunch of stinging nettles—and the nest must not be disturbed, or the birds will forsake it. Watch the birds, and having from your hiding-place "spotted" the nest by seeing the hen fly off, wait till the birds are out of sight. Then remove the eggs, leaving a few china nest-eggs. Mate two or three hens to a cock, and set the eggs in April or early May under a broody hen.

The eggs take from twenty-six to twenty-eight days to incubate, and when the chicks arrive they should be "cooped" for the first week to get strong on their feet. Start them off with egg and bread crumbs and finely chopped green food. They must be managed on the lines recommended for ordinary chickens. The hens go broody, but not till the end of the summer. Of recent years the Guinea-Fowl has found its way on to the show bench, many fanciers now breeding and showing these unique but handsome fowls. For the farmer the cult of the Guinea-Fowl should prove another good string to his bow.

Turkeys.—The cult of the Turkey provides another excellent side-line for the farmer, the Small-holder, or the country-dweller who has a little well-drained land to spare. The rearing and fattening of Turkeys for the Christmas market will put many pounds into the owner's pocket. Christmas is always with us, as is the demand at that time for the Turkey, and even if but £10 or £20 is made as the season's profits, this will help the exchequer along. I know friends who have made as much as £100 profit from their Christmas Turkeys, and as a side-line those who can should engage therein. Strict accounts should be kept, and these should not be mixed with those of any of the other farm stock. There is ample scope in this branch of Poultry Husbandry, and the man who adopts common-sense methods *must* score.

Below I give the breeding stock of Turkeys in Great Britain according to the census of 1908, and the number in Ireland judged by that of 1912 :—

England	146,000	Scotland	27,000
Wales	26,000	Ireland	176,000

Any barn or out-house, provided it is well ventilated and light, will provide suitable accommodation for Turkeys. A few glass windows will admit light, and apertures covered with wire-netting will admit fresh air. Place a few bricks in the corners to act as nests, and fill the spaces so made with straw. Some hens prefer to lay in the field near the homestead, so that at laying time it is advisable to leave straw here and there in likely spots. An open-fronted cart-shed will make good sleeping accommodation. Collect the eggs regularly

and leave a dummy china egg in each nest. Stock Turkeys are easy to feed, the usual meals and grains recommended for fowls being suitable in every way. Use well-matured birds for breeding, mating two-year-old or more males to pullets and old hens to cockerels—the former for choice. For market purposes use males scaling from 20 to 25 pounds, and females 18 to 20 pounds. From four to ten females will not be too many for a male, according to the range given the birds, but to increase stamina and size introduce fresh blood every three years or so. The Turkey hen starts to lay about March and lays two batches of eighteen eggs or more each. Do not let her sit between the two batches. Some hens, of course, will lay from fifty to a hundred eggs in a year. "Strain" is the determining point. Some set the first batch of eggs under ordinary broody hens, allowing the Turkey hen to incubate the second batch of eggs. When the chicks from these arrive those from the hens are handed over to the Turkey mother, who is able to care for a considerable number of chicks. Do not give the ordinary hen too many eggs—six or seven will be sufficient, according to the size of the broody and the amount of fluff she carries. The Turkey hen can cover any number up to sixteen or so.

The eggs take twenty-eight days to hatch. Allow the Turkey hen to sit where she desires, and do not disturb her, for the Turkey mother is very peculiar unless she has grown accustomed to the feeders. Keep the Gobbler away, for he is spiteful to the young chickens. Provide the hen with a dust-bath and drinking water, and feed her regularly on maize. When the little chicks arrive, coop up the hen till they get strong on the legs, and feed them "little and often," also "early and late." Egg and bread crumbs with finely chopped stinging nettles, onion-tops, dandelions, lettuce, etc., will make a good feed to start the chicks on, and boiled rice can also be given. A little oatmeal can be added to this feed for drying-off purposes. Give plenty of grit and drinking water, and make free use of green food. Skim milk is good both to drink and in the soft mash. As the chicks grow grains can be given, rice, broken wheat, canary seed, groats, etc., being suitable. At six weeks old ground oats, middlings, greaves, and bran will make a good soft mash with wheat, maize, and oats as the grains. The latter can as a change be occasionally boiled. Remove the coops to fresh grass regularly, and run the young Turkeys on the stubbles after the corn has been carried. As they get old enough to perch, they can be given open sheds or structures as accommodations, but do not permit early perching, or crooked breasts will result. When they eventually perch, see that the perches are low. At from six to eight weeks old the young Turkeys "shoot the red," and must be well fed and cared for. Afterwards they soon thrive.

Provide the youngsters with shelters in the field, and as they grow up all can be quartered together in a large barn if one is handy. In recent years experiments have been made in allowing Turkeys to occupy woods in their wild state.

In fattening for market keep the birds growing, feeding them for flesh and frame. Use foods according to the class of market being catered for. Market those that are ready in November and December, and leave any that are not so forward till January or early February. The trade is quite as good before and after as at Christmas. If a Turkey is ready in November, why go to the expense of extra food for several weeks, when no better price will be obtained for the bird? Select a different rearing ground each year, well liming the old land and growing a crop of lucerne thereon. For Turkeys being fattened for market, any of the following can be used in the rations: cut bone, bone-meal, cooked vegetables, maize-meal, boiled potatoes, fatty meat, house scraps, oatmeal, oatmeal porridge, melted suet or fat, barley meal, skim milk, etc. Oats, wheat, and maize (occasionally boiled) make good grains. Give two substantial meals a day.

There are many ways of preparing Turkeys for market. The Norfolk method is to hang the bird up by the legs with its wings crossed to prevent struggling. A quick blow on the back of the neck renders the bird insensible, when a knife is inserted in the roof of the mouth and the brain pierced. The bird must be starved for twenty-four hours before being killed. It must be roughly plucked—all except head, neck, and pinions—and fully chilled before packing. The birds are usually wrapped in linen cloths that have been dipped in skim milk and then sent to market. The American Mammoth Bronze makes the greatest weight, followed closely by the White Turkey. The Cambridge is smaller than the Bronze; the Norfolk or Black carries a good amount of sweet meat. There is no Turkey to beat the "Home" produce, and those that come from abroad are not very large and are only purchased because they are small and suitable for small families. The Irish Turkey, too, takes some beating.

Turkeys are extensively bred for exhibition, and there is good money in this particular line, both from sittings and stock birds.

CHAPTER XIX

The Cult of the Bantam.

Bantams v. Large Poultry—For egg-production—For exhibition—On the farm—For the juniors—Housing—Breeding—Feeding—Hatching—Rearing—Breeds of Bantams.

THE cult of the Bantam is a very fascinating pursuit and one that all can engage in. It is hoped that the following notes will entice many to take up these pretty Miniatures of the Poultry World.

Bantams v. Hens.—Bantams clash with and defeat the little domestic hen under very many circumstances. Many town-dwellers, owing to insufficient accommodation for fowls, have to satisfy their love for feathered pets by keeping Bantams. Others, too, would be debarred from keeping a rooster whilst the neighbours could not object to the Bantam cockerel's song. The Miniatures have very many points to their credit. They are easily accommodated—requiring small houses and runs—are small eaters, very fascinating pets, and may be kept with a minimum of trouble.

For Egg-production.—Far too many are under the impression that Bantams lay very few eggs and small at that, and are therefore not worth ground-space. This is not the case, for given a good strain of a "laying" variety, such, for instance, as the Old English Blackreds, eggs will be very plentiful. If one desires a breed for eggs, he would naturally not take up a variety that was bred solely for its "Fancy" points. The eggs are, of course, smaller than those of hens, but they are just as nutritious, and many Bantams lay eggs as large as pullets' eggs. For invalids Bantam eggs are ideal, as they are for children, where a hen's eggs would be too large to eat at one meal.

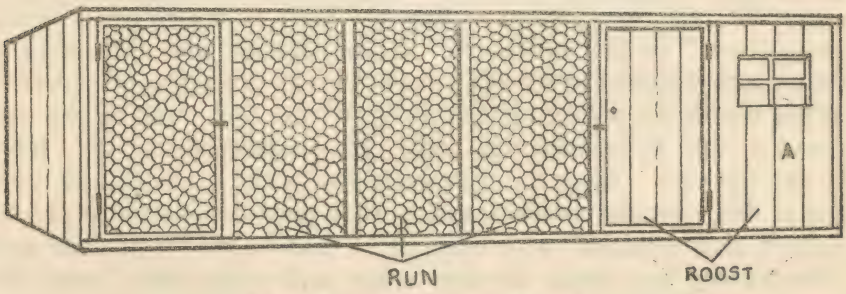
For Exhibition.—Bantams are very extensively bred for exhibition purposes, and high-class specimens in the popular breeds command high prices. Many Miniatures have brought in £50 apiece for their breeder, and £20 and £30 are quite common prices for individual specimens. When I say that over 1500 valuable "wee-ones" have been exhibited at the Crystal Palace at one show, my readers will understand how extensively kept for exhibition the Bantam is. If a suitable

variety is chosen, the backyarder has an equal chance of breeding tip-top specimens with the big man. Where the poultry-keeper so desires, nothing is to prevent him from keeping a pen of Bantams as well as one of large fowls. Another point in favour of Bantams is that the carriage to the show is quite a small item.

For the Juniors.—Bantams make excellent pets for the Juniors, and I would very much like to see children encouraged to keep them by their parents. A trio of Miniatures can be purchased cheaply if required just as pets and for eggs, and a house and run can be built or purchased for a few shillings.

On the Farm.—Even the poultry-farmer can derive much profit from keeping Bantams. As previously stated, if he keeps large fowls he can run Bantams of the same breed to lend additional interest to his farm-work and to help along the profits. The poultry-farmer can keep exhibition strains and send specimens out to the shows with his other prize fowls. Carriage to the show is not expensive, and four or five Bantams can be dispatched in a single four-compartment basket.

Housing.—Practically any design of house and run will do to accommodate the Miniatures. In most back-gardens there are walls suitable to act as the back of the house and run, and only a few shillings need be expended in completing the structure. The house and run need be but 4 feet high in front and 3 feet at back, and anything from 9 feet in length, according to the ground space at one's disposal. I give below a sketch of a Bantam house and run :—



BACK-GARDEN BANTAM HOUSE.

There is a door to the roosting section, the latter having a glass window to admit plenty of light. The roosting place must be entirely boarded in with the exception of the outlet to run. The run is of small-meshed wire-netting with door at one end and both run and house are roofed in. The owner can, if he desires, fit a six-inch deep board along the entire front at the bottom to prevent rain from beating in. The run should consist of earth, which should be kept always soft and

scratchable. Construct the house and run to face the south, backing the cold north and north-east winds.

As regards the internal fittings of the house, the perches should be about one and a half inches square, with the rough edges at the top planed off, and these should fit in slots so as to be removable for cleaning purposes. The nest-boxes should measure about ten inches square.

Breeding.—In the first place, start with good parent stock and improve their qualities as you go on. A male bird will look after any number from three up to five females, according to his age and vigour. If you are breeding for exhibition, put yourself into the hands of a well-known fancier and let him sell you at a reasonable figure a trio or quartet of good breeders. Exhibition Bantams *must* be midgets, and so science comes into play in their breeding. Both male and females must be small. To the former we also look for style, colour, and headpoints, and to the latter shape, contour, and headpoints. In breeding exhibition Miniatures, breeding, feeding, and rearing speak for much. In the case of heavy-fluffed feather-legged varieties, some breeders clip the fluff under the tail, etc., to help the fertility of the eggs. In breeds where reach is a *sine qua non*, the youngsters are enticed to feed from a trough placed high up in the run, so that their stretching will promote height and raciness. Do not breed from over-fat birds.

Hatching and Rearing.—Some Bantam hens are good sitters, but others are not to be trusted. A Silkie hen makes a capital broody for Bantam chicks, and failing her use a small ordinary hen. The eggs take from nineteen to twenty-one days to hatch, some chicks being "out" on the nineteenth. Having set the hen, chalk up the date near the sitting box, and also the date the chicks should come off. When the chicks arrive, they must be fed the first week on egg and bread crumbs moistened with milk. Pin oatmeal can be used later to dry off with. After the first week give boiled rice dried off with pin or finely ground oatmeal, and as they get older biscuit meal well scalded and dried off with oatmeal or middlings. Feed little and often—every two hours the first week, and every three hours the next three—and when the chicks are two weeks old introduce a daily feed of small dry chick feed. At the end of the month they can have two dry feeds a day. Four meals a day will suffice from a month to three months or so old, then three meals a day. As the chicks grow they can have rice, canary seed, dari, buckwheat, small wheat, groats etc. Give them plenty of grit, drinking water, and finely chopped green food.

Feeding Adult Bantams.—The feeding of the adult stock will naturally depend upon whether the birds have free range or are

confined. Due allowance must be made for any food they may find for themselves. As regards the morning mash—given warm in winter and cold in summer—utilise therein all house scraps and stale bread, and use biscuit meal as the foundation, drying off the whole with middlings and bran. At mid-day give green-food, and at night grain. Wheat makes a good staple grain, but Bantams, like humans, appreciate a change, and this should be quite an easy matter, for they are fond of and do well on: split or broken peas, rice, dari, canary seed, buckwheat, and oats (clipped for preference), and in cold weather split maize and hempseed.

Harvests.—For the man who takes up the cult of the Bantam, the harvests will be in (1) sittings of eggs, (2) young birds, and (3) stock birds. In season sittings of eggs are in much demand, as are stock birds all the year round. The keen business man will interest local well-to-do people (by means of advertisements in local papers) to purchase eggs or stock birds for their children. I have never seen an advertisement offering sittings or Bantams for sale in any of the boys' or girls' papers, but if I see any after this date I shall make a mental note that they are from persons who have read this volume of mine.

Breeds of Bantams.—I should want a good-sized book if I was expected to touch upon the scores of breeds of Miniatures. Suffice it to say here that there is very wide choice of colours and shapes, and that most of the larger breeds of fowls have their smaller counterparts. There is a sufficient variety for any one's taste—self-coloured, pencilled, laced, spangled, barred, feather-legged, clean-legged, crested, frizzled, etc. Even if I gave family names I should not end, for each has many colours. Rosecombs, Old English Game, Sebrights, Cochins, and Wyandottes are all most popular and useful.

CHAPTER XX

Technical Terms as used by Poultry-Keepers.

WHEN a poultry-keeper mixes with fanciers it is always nice to be able to feel "at home," as it were, by having a complete knowledge of the technical terms as used by poultry men. Below will be found a list of common terms that should prove of assistance to readers. At some time or other every reader will be called upon to settle a dispute over the name of the male or female swan; I have scores of times. They will be found in the following list :—

A.O.C.—Any other colour.

A.O.V.—Any other variety.

Balanced Ration.—Containing correct proportion of albuminoids and carbo-hydrates.

Barred, Barring.—Dark and light stripes across a feather.

Bean.—Dark marking on duck's beak.

Beard.—Feathers under throat in certain breeds.

Beefy.—Applied to coarse heavy comb.

Bloom.—Gloss on feathers—condition or sheen.

Bootings.—See "Footings."

Brassy.—Yellow feathers caused by sun or bad breeding.

Breast.—From point of breast bone to throat in live fowl; each side of breast bone in dead (table) fowl.

Breed.—Kind or family of a fowl.

Bricky.—Harsh red colour on Buff and Black-red cocks. Bad point.

Broiler.—American term for table fowl.

Bronze.—Bronze hue on black feathers; fault.

Brood.—Number of chicks.

Broody.—Hen's desire to hatch eggs. Fever.

Brooder House.—Large accommodation for chicks. Artificially heated, divided into sections, and having an outer grass run to each compartment.

Brows.—Overhanging eye-brows. Peculiarity of Malay fowls.

Cape.—Feathers between shoulders (under base of hackle).

Capon.—Castrated table fowl. Operation allows quicker growth.

Carriage.—Style of a fowl.

Caruncles.—Fleshy protuberances on Turkey cock's neck.

Chain-armour.—Lacing on breast of Rouen Drake. A bad point.

Character.—Style. "Full of character"—fancy term.

Chick.—Newly-hatched fowl—up to few weeks old. *Chicken.*—Also used for young fowl until a year old.

Claret.—Colour on Rouen Drake's breast.

Clean-legged.—Minus feathers on legs. Opposite to "feather-legged."

Cob.—Name of male swan.

Cobby.—Sturdily and compactly built.

Cockerel.—Utility—young male till first adult moult; Fancy—hatched in same year as exhibited.

Cock-breeder.—Male or female that when mated will produce better males than females.

Cold-brooder.—Small sleeping house (minus perches) for young chicks after leaving hen or foster-mother.

Collar.—White ring round Rouen Duck's neck.

Colony House.—Used on open range—stubbles, fields, or orchards. Movable house (sometimes on wheels) to accommodate up to twenty-five birds.

Comb.—Fleshy head-ornament of fowl (either sex).

Comb-over.—Comb dropping to one side of head. Invariably a fault with *male* birds.

Compact.—Neat and stylish. In full plumage.

Condition.—Applies to fowl's plumage or health.

Coop.—Small accommodation for hen and chicks, broody hens, etc.

Coverts.—Wing coverts or bars—feathers covering top of flight feathers. Tail coverts—small curved feathers at root of tail.

Cradle comb.—Usually applied to Wyandotte's rose-comb.

Crammer.—Appliance for "cramming" table chickens.

Crest.—Feathers on top of head. Seen in Houdans, Polish fowls, etc.

Crop.—Fowl's food receptacle in lower part of breast.

Cross-bred.—Mongrel. Composed of many varieties.

Cull.—A "waster" or "throw-out."

Culling.—Selecting and removing "wasters" from a flock of fowls

Curves.—The three—neck, back, and tail—curves of a Malay.

Cushion.—Feathers at end of hen's back and partly covering tail.

Cygnet.—Young swan.

Deaf-ears.—Same as ear-lobes.

Deep-bodied.—Great depth from back to breast.

Developing Coop.—Same as cold brooder. Small house for chicks too old for hen or heated brooder, but too young for adult houses.

Diamond.—Fanciers' term for wing-bay or wing-end.

Dished.—Lobe that is hollow in centre.

Dished-bill.—Down curve in upper bills of Pekin and other Ducks. Aylesburys are straight from bill to top of skull.

Distinct.—Having barring or facing free from ground colour.

Double-laced.—Inner marking on Indian Game hen's feathers. When an outer edging of ground colour beyond black lacing of Wyandottes, etc., it is a fault.

Double-mating.—Mating two pens, one to breed cockerels, the other to breed pullets excelling in show points. Often used where females have different markings to the males.

Dry mash.—Composition of meals fed to fowls dry. Popular American method of feeding "Intensive" hens.

Dubbing.—Cutting off comb and wattles. *Breeding* males of heavy-combed breeds are usually "dubbed," as are *exhibition* Game (large) and Game Bantams.

Duck-footed.—Where back toe is carried close to other toes and not well spread out behind.

Ear-lobes.—Red or white according to breed. Skin below ears.

Early-hatched.—Hatched before April in Heavy breeds; before May in "Lights."

Face.—Skin round the eye.

Feather-legged.—Feathers on sides of shanks and feet.

Feather tracks.—Areas where feathers grow; they do not grow evenly.

Finely-drawn.—Applied to tall, fine-boned birds.

Fireless Brooder.—Small box fitted with felts or cushions under which newly-hatched chicks nestle. The felts, etc., retain the heat dispensing with lamps or broody hens.

First-cross.—Composed of two *pure* varieties only.

Flat-shins.—Flat fronts to Game bird's legs instead of round; fault.

Flights.—Primary or flying feathers of wing. Folded out of sight when not in use.

Fluff.—Downy part of feathers, also soft body feathers.

Footings.—Foot-feathers of feather-legged varieties.

Foxy.—Dark-red wing-colour in Black-red varieties; fault.

Furnished.—Fully feathered. Fit in plumage.

Gay.—High or "squirrel" tail. Also large "heavy" spangling.

Gills.—Region of throat and wattles.

Gobbler.—Male Turkey.

Green bone.—Fresh-cut bone from butcher's; nothing to do with colour.

Grey.—Black and white mixture on feathers of self-coloured breeds. Fault.

Gullet.—Loose pouch of skin under mandible of Toulouse Gander.

Hackles.—Narrow feathers on necks of fowls and saddles of cocks.

Hangers.—Thin feathers at root of cock's tail.

Hard-feathered.—Tight-feathering; scanty fluff; fit.

Heavy breeds.—Sitting varieties; brown-egg layers.

Hen.—Female after first adult moult; in second season's lay.

Hen-feathered.—Males with plumage of females. "Henny" males.

High-in-back.—Round-shouldered; hump-backed.

Hock.—Joint between shank and thigh.

Hollow.—Depression in lobe or comb.

Horse-shoed.—Feathers with "horse-shoe" instead of round lacing.

In-breeding.—Breeding from blood relations.

In-kneed.—Knock-kneed.

Intensive Houses.—Structures for hens kept intensively—no outside runs being provided. *Semi-Intensive Houses.*—Where the fowls are allowed a run out occasionally.

Intensive System.—A method (American origin) of keeping a *large* number of fowls on *limited* ground-space.

Irregular.—Irregular serrations of comb or irregular lacing.

Keel.—Loose flesh and feathers from breast of duck or fowl.

Knock-kneed.—Where hocks almost touch.

Lacing.—The outer edging to a feather—darker hue than ground.

Late-hatched.—Hatched after April for "Heavy" breeds and May for "Lights."

Leader.—Applied to termination of a "rose" comb.

Leg-feathers.—Feathers on shanks of certain breeds.

Light Breeds.—Non-sitting varieties; layers of white eggs.

Limber.—Massive bone. Fancy term.

Limby.—Tall; length of thigh.

Line-breeding.—Breeding systematically, keeping blood of each parent to certain defined proportions. Adopted to "fix" certain laying or "fancy" points. To be recommended.

Lobe.—See "Ear-lobe."

Low-built.—Low on leg; body near ground.

Mandibles.—Upper and lower beak.

Marbled.—Ticked; laced feathers on Pile Game cock's breast.

Mazarine.—Blue or purplish markings on black feathers.

Mealy.—Buff feathers dotted with white spots. Fault.

Mooning.—Moon-shaped markings of Spangled Hamburgh.

Mossy.—Brown mixture on white feathers; fault.

Moulded.—Shapely; stylish; built.

Moult.—The casting of a fowl's feathers.

Muff.—Side whiskers on certain breeds. Muffings; muffling.

Non-sitters.—Breeds that are not given to broodiness. Exceptions are known.

Openly-barred.—Bars wide apart.

Openly-laced.—Laced feathers well placed over body.

Pea comb.—Triple comb ; three small combs side by side.

Ped.—Light crate to hold dead poultry for market.

Pen.—Female swan.

Pen.—Enclosure for fowls.

Pencilling.—Narrow stripes across a feather.

Pencilly.—Comb with *thin* spikes.

Peppered.—Spots on feathers ; black spots on buff ; black spots on laced feathers ; a fault.

Petits Poussins.—Milk table chickens (fed chiefly on milk foods) marketed at six weeks old and weighing about six to eight ounces each. French term.

Points.—Marks allowed certain " standard " characteristics.

Poult.—Young Turkey.

Poultry.—Fowls, Ducks, Geese, Turkeys, Guinea Fowl, Bantams.

Primaries.—First ten (flight) feathers in wing.

Pullet.—Fancy—female hatched in year exhibited ; Utility—female till first adult moult, then a " hen."

Pullet-breeder.—Male or female that when mated will produce better females than males.

Pure.—True to characteristics of breed ; not " crossed."

Purply.—Purple hue to black feathers ; fault.

Quill-bound.—In chicken (feathering) or fowl (moulting) where web of feather is retained in sheath. Sheath should be carefully pricked with needle.

Racy.—Stylish, alert, sprightly.

Reachy.—Tall. Characteristic of certain breeds.

Ribbon.—Marking across Duck's wing.

Roach-back.—Humpty back. Avoid for breeding ; bad fault.

Rooster.—Male. Popular American term.

Rose comb (*R.C.*).—Broad full comb covered with small points.

Saddle.—Back of *male* near tail ; " cushion " in *hens.*

Sappiness.—Cream tinge or sap on white plumage ; fault.

Scales.—Horny sheaths on legs.

Scratching shed.—Open-fronted house with littered floor. Corn is scattered in litter to promote exercise.

Secondaries.—Second lot of stiff wing-feathers.

Self-colour.—Single uniform tint all over bird.

Serrations.—Spikes on " single " comb ; should be wedge-shaped.

Shaft.—Stem or quill of feather.

Shafty.—Quill lighter in colour than ground colour ; fault.

Shank.—Scaly part of leg.

Sheen.—Gloss on plumage ; condition.

Sickles.—Top curved feathers of cock's tail.

Side-sprigs.—Extra spikes at side of single comb ; fault.

Single comb (*S.C.*).—As opposed to Rose or Pea comb ; upright in males, often falling over in females.

Single-mating.—Mating up *one* pen to breed " exhibition " birds of both sexes.

Sitters.—Breeds that " sit " and incubate their eggs.

Smut.—Smoke-coloured undercolour ; fault in Buff and Red birds.

Sorting-board.—Board with various sized holes in into which eggs are placed to be graded into " sizes " for market.

Spangling.—Spot or splash on different coloured ground.

Spikes.—Serrations to comb—even and wedge-shaped.

Split-crest.—Crest that is open and falls to one side instead of globular.

Spur.—Horny spike on male's shank (for protection).

Squirrel-tailed.—Where tail curves towards neck ; fault in most breeds.

Stag.—Young Game cock ; Turkey cock.

Standard.—Scale of points for judging.

Station.—Symmetry ; balance.

Steppings.—Tops of secondary feathers which resemble steps.

Strain.—Special quality in a fowl handed down to progeny.

Striping.—Marking in neck and saddle hackles.

Style.—Build ; character, shape, finish.

Surface-colour.—Part of feathers exposed to sight.

Symmetry.—Balance, proportion.

Tail-coverts.—Curved feathers at root of tail.

Tail-feathers.—Stiff and straight feathers of the tail.

Team.—Number of birds owned by one exhibitor.

Thighs.—Joint above shanks ; drumstick.

Thumb-mark.—Indentation in comb like " thumb-mark."

Ticking.—Dark specks on light ground.

Tight.—Glued-down appearance of plumage.

Tipping.—Coloured tips at end of feathers.

Tom.—Male bird ; male Turkey.

Top-knot.—Crest ; feathers on top of head.

Tri-coloured.—Where a bird's hackles, saddle, and tail are of different shades and wing bow darker still, instead of one shade. A " Fancy " fault.

Trio.—Male and two females.

Under-colour.—Part of feathers seen when plumage is opened.

Variety.—Coloured member of a " breed."

Vulture-hock.—Stiff, outstanding quill feathers at hock joint.

Waster.—Mismarked, cull, not up to standard.

Wattle.—Red hanging flesh under beak.

Web.—Flat skin between toes ; flat part of feather ; skin seen when wing is extended.

Wing bar.—Bar caused by wing coverts.

Wing-bay.—Three-cornered part of folded wing between wing bar and point below the bar.

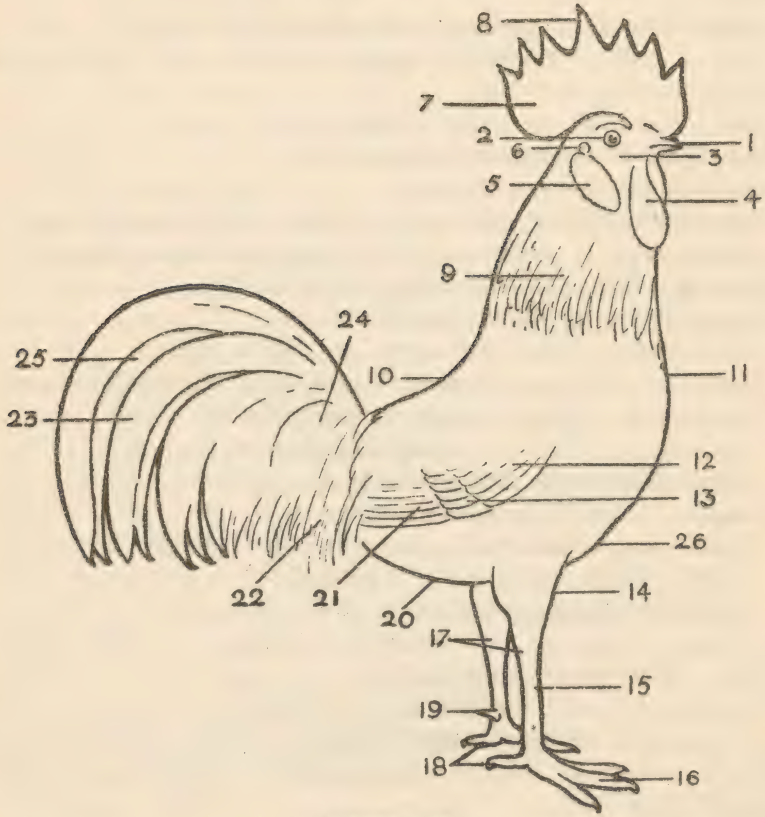
Wing-bow.—Shoulder part of wing above the bar.

Wing-butts.—Ends or corners of the wings. *Upper* ends are the shoulder-butts and *lower* ones the lower-butts.

Wing-coverts.—See "coverts."

Wry-tail.—Tail carried to one side of body. Deformity.

Points of a Fowl.



REFERENCES.

1. Beak or mandible.
2. Eye.
3. Face.
4. Wattle.
5. Ear-lobe, or deaf-ear.
6. Tuft covering the ear.
7. Comb.
8. Spike or serration.
9. Neck hackle.
10. Back or saddle.
11. Breast.
12. Wing bow.
13. Wing bar or coverts.
14. Thigh.
15. Shank.
16. Toes.
17. Hocks.
18. Back toes.
19. Spur.
20. Fluff.
21. Wing bay or secondaries.
22. Saddle hackle.
23. Sickles.
24. Tail coverts or hangers.
25. Stiff or hen tail.
26. Keel, in varieties where this is prominent.

CHAPTER XXI.

What every Poultry-Keeper ought to Know.

Clean Hampers.—Before placing a bird that has just been washed into a hamper see that the latter is clean. Give both canvas and basket a frequent scrubbing. In the winter add a second canvas to the basket to keep the inmate comfy whilst going to and from a show.

Eggs, Stamina, and Type.—Messrs. Eastman Bros., Suffolk Poultry Farm, Hadleigh, aim at laying capabilities, stamina, and type in their well-known strains. Their farm is situated on a heavy clay and exposed site and covers some 150 acres, thus ensuring stamina in chicks bred by their 2000 head of breeding stock. Laying qualities are fixed by the use of the trap-nest and vigour by the employment of hens as breeders. Eggs, chicks, and stock birds are supplied. A speciality is made of day-olds, an American mammoth incubator being used. Most of the popular breeds are kept.

Grading Eggs for the Market.—Eggs can be quickly graded into sizes by means of a simple board with holes of different sizes therein. Some poultry-keepers grade according to the length of each egg. Strips of wood are nailed on a board, the spaces between being of various measurements.

Layers of Large Eggs.—Mrs. Charles Cartwright, Greatford P.F., near Stamford, specialises in large-egg strains of White Wyandottes, White Leghorns, Houdan-Leghorns and Light Sussex. In the 1916–17 Laying Competition at Harper Adams College it is well to recall that her pen 65 laid 852 *first-grade* eggs out of a total of 876. Eggs and day-old chicks are supplied, and a catalogue may be had free on receipt of a p.c., this brochure containing particulars of the " Greatford " poultry house.

Crop Troubles, etc.—Never give adult fowls or chicks long pieces of grass or crop troubles will ensue. Cut up into small pieces such foods as grass, bacon rind, cheese rind, cabbage, greenstuffs, etc.

Turkeys in Suffolk.—Turkeys are great favourites with many lady poultry-keepers. Miss E. J. Appleyard, Eastern P.Y., Ixworth, Suffolk, prefers the American Mammoth Bronze, having a nice stud of same. The American Mammoth is without doubt an excellent Turkey, growing to an immense size, but poultry-keepers should make sure of well-bred stock birds.

Hatching "Preserved" Eggs.—It is not generally known that eggs have been found to hatch out chicks after spending six months in an egg-preservative. Yet such is the case, the eggs having been washed before being incubated to remove the coating placed around the shells by the preservative.

How to get Eggs.—Every pullet directly it "comes of age" has in its body, as I have mentioned, several thousand ova. Thus equipped, she presents herself to her keeper as if saying, "Here I am, kind master, with two thousand eggs in my cupboard. Treat me well and give me the proper food and I will *develop and produce* those eggs. If the food you give me does not help me in that direction, I shall *devour* the majority of the eggs, for I shall be compelled to draw from the reserve that nature has provided me with." Bearing this in mind, the wise poultry-keeper will give the food the layer asks for, and will take steps to see that each and every laying fowl produces her maximum number of eggs in the shortest time. Karswood Spice will do wonders in keeping the hens busy in the nests and yielding the greatest returns, whilst "in profit." It has no harmful effect on the internal organs, for a post-mortem on a hen which laid 181 eggs in twelve months revealed a normal-sized liver and well-developed ovary. It is stated that no less than 100,000 poultry-keepers are using Karswood Spice regularly, a 2*d.* packet supplying twelve hens for one week. Another Karswood speciality is the Karswood Complete Poultry Meal (Sussex Ground), this being an excellent *foundation* for the morning mash. The latter may consist of: 1 part (by weight) Karswood Meal; 1 part bran and 1 part middlings, with 1 tablespoonful of Karswood Spice to every 20 birds. It is on this mash that a Mr. Turner's 16 pullets are paying his rent week after week out of the egg-profits. Karswood Spice (also Meal) can be had of all corn merchants, grocers, or chemists from a 2*d.* packet to a 28-lb. tin. On receipt of 1*s.* by Messrs. Karswood, 855, Deansgate Arcade, Manchester, sufficient Karswood Spice for 20 hens for 32 days will be sent post free, together with free sample of Karswood meal and an interesting brochure.

Preserving Grass Runs.—Never throw soft food on the floor of grass runs or the scratching of the fowls will wear the grass thin. Feed all soft food in troughs and grain in the litter of the scratching-shed.

An Excellent Dry Mash.—When one of our most successful egg-farmers places at the disposal of his fellow poultry-keepers the system of feeding his own heavy egg-producers, that person is conferring a boon on Poultrydom. After six years' experiments with the Dry-Mash system of feeding, Mr. Jonathan Collinson, Lingart P.F., Barnacre, Garstang, Lancs., has now placed upon the market the very DRY MASH that his pedigree layers are fed on. There is no more scientific breeder of high-class utility stock than Mr. Collinson, on whose farm 200 trap-nests are in daily use. His "Lingart Dry Mash" then, as advertised in this volume, is worthy of the attention of all interested in egg production. Buff Orpingtons, Black Leghorns, White Leghorns, and White Wyandottes are the breeds specialised in, and only hens laying from 200 to 280 eggs per annum are used as breeders, whilst particular attention is paid to all sires to see that they are from *mothers* having from 200 to 280 eggs per annum to their credit. Elsewhere in this volume I have dealt fully with the Dry-Mash system of feeding fowls, and touched upon the hoppers used and the methods as carried out. I can thoroughly recommend the system, and the fact that 110 eggs have been collected in one day from 130 birds speaks volumes for the "Lingart Dry Mash," with which they were fed. A profusely illustrated catalogue will be sent post free to readers mentioning this work.

Trough-feeding of Chicks.—Give the chicks their soft food in troughs, using plenty of the latter, so that one and all can feed. Do not leave soft food about after each meal, or the little chicks will lose their appetites.

The Noble Cochin.—The Buff Cochin is a noble breed to be sure, and when we look down the list of breeds, few there are that have not a dash of Cochin blood. Another example of the importance of specialising is provided by Mr. G. H. Procter of Flass House, Durham, who has bred Buff Cochins—his favourites—for forty years. During this time his birds have won over 10,000 prizes, and not a Dairy or Palace Show goes by without a "Flass House" Buff Cochin winning the premier ticket. Picture a beautiful ball of buff fluff, and you have the Buff Cochin. It was not long ago that one of Mr. Procter's Buff Cochins created a sensation in the World of Poultry by winning the championship for best in show at the Crystal Palace—beating thousands of England's best birds in all breeds.

Handling Fowls at Night.—Handle fowls at night, using a hurricane or stable lamp. Fowls are stupid at night, and so all new-comers should be added when the birds are at roost. Occasionally handle the birds whilst they are roosting to see if they are in good condition.

The War-Breed.—In the chapter on "Breeds" I have referred to the Russian Orloff—a new "war" breed. It is to Mrs. C. Colbeck, of Boyle Hall, West Ardsley, near Wakefield, that the credit of introducing this splendid variety belongs. This enthusiastic lady fancier has done very much to popularise the Buttercup and Rhode Island Red. The Orloff is a beautiful Russian breed and is peculiar in having a "raspberry" comb and being a *non-sitting* table variety. Rumour has it that the breed takes its name from the celebrated Russian Admiral Orloff who strangled Peter III. Most of the popular breeds are kept by Mrs. Colbeck, including Light and Speckled Sussex which should be more widely kept by poultry-keepers. Buff Orpington Ducks are also stocked, and you can always rely upon a fair deal with this lady-breeder.

Making Friends.—It is a good plan to let new-comers stroll up and down the run (outside) the day before they are to be placed on the perches. They will then make friends with the inmates.

To Assist Aspirants.—Novices are well catered for in the World of Poultry, and such should be the case for they are a "power." "Chanticleer" is one of the most widely-read and appreciated poultry writers of the day—in and out of town—and covers the name of a highly popular Midland poultry expert. He has recently formed a Bureau to help aspirants, and every post that reaches "Chanticleer," c/o *Weekly Post*, Liverpool, is a very heavy one. I expect there are very few of my readers who do not enjoy "Chanticleer's" weekly menus in the Provincial Press.

Love for Fowls.—To be successful in Poultry Husbandry, no matter what the branch may be, one must have a natural liking for fowls. Cultivate that love and you will succeed.

A Splendid Performance.—It is not often that a poultry-breeder meets with success in any Laying Contest with his first entry. Yet this happened to Mr. Oscar Bland's pen of White Wyandottes which won 2nd in the Small House section of the 1916–17 Laying Competition at Harper Adams College. In addition the birds carried off second prize over all breeds competing. This is an honour to be proud of and bears testimony to the breeding methods adopted and the laying power of the strain. Address :—Fosse House, Ettington, Warwickshire.

Dropping their Eggs.—Ducks have a habit of dropping their eggs into the water if allowed out before they lay. As the Ducks carry their eggs low, the owner can see which should be kept in the house to lay. Ducks lay very early in the morning.

400 Feet above Sea-Level.—Vitality counts for much in Poultry Husbandry, and that is why the would-be poultry-keeper should purchase eggs or chickens from hardy stock. One can naturally expect a vigorous stud of birds on such a farm as the Cleveland P.F., Standon, Herts, owned by Mr. Sydney Hiller—for it is 400 feet above the sea-level, the breeding pens are kept on large grass runs, whilst chickens and growing stock roam at large over orchard and meadow. Such must ensure natural growth, vigour, and general hardiness. Specialising again comes to the fore, for we see Mr. Hiller paying careful attention to Wyandottes—Gold-laced, Silver-laced, and White, with S.C. Rhode Island Reds, White Leghorns, and Buff Orpington Ducks following them up. When a breeder is a member of the Poultry Club, Utility P.C., Rhode Island Red Club, Gold and Silver-laced 'Dotte Club, Herts Agricultural Society, and other Associations—such as Mr. Hiller is—well, you can be sure he does nothing in half-measures, but is a poultry-farmer to the core and has a natural liking for the poultry cult. No detail can therefore escape his attention. A visit to the Cleveland P.F. would make some stop as pupils, I am sure, whilst others would be sure to be buyers.

The Ducklings' Toilet.—Always place grit in the drinking-water given to Ducklings, as the little ones rout their beaks therein and so clean their nostrils.

Peat Moss as Litter.—For keeping poultry houses free from offensive smells peat moss litter is excellent. Besides being a deodorizer, it is an absorbent, and there is hardly anything connected with poultry where it cannot be made full use of. As bedding for backyard houses, breeding-houses, intensive-houses, brooder-houses, foster-mothers, dust baths, nest-boxes, etc., peat moss litter is excellent. It is really surprising how cheap the litter is when bought in quantities direct from the Peat Moss Litter Supply Co., Ltd., Thorne Wharfe, Commercial Road, Blackfriars, London.

Oil for Incubators.—Never run short of oil for incubators or foster-mothers, and on no account mix two brands. Buy in quantities, and the best brand.

France's Favourite Fowl.—A breed that is deserving of more popularity with English poultry-keepers is La Bresse. Bred in two colours —Black and White—these fowls (from the Province of Ain in France) are extensively bred in France for their table qualifications. Mrs. Hollams, of Dene Park, Tonbridge, is a very keen hobbyist, and year after year imports from the land of our brave Ally eggs or stock birds. La Bresse fowls have many points in their favour, being small eaters,

hardy, active, handsome, excellent layers, and magnificent table fowls. I have always highly recommended this dainty breed, and would like to see it become more popular.

Scorched Corn.—There is nothing like variety in feeding. Scorched grain will be appreciated as a change. Place the grain on a shovel over the fire and allow to darken; when cool give it to the fowls or chickens.

The Commercial Duck.—The Runner Duck is very much in the limelight just now, and should be more widely kept for the commercial egg. There is good money in duck-keeping, which can be made highly profitable where there is grass range. Mr. E. A. Taylor, Rotherwas, Hereford, has always devoted much care to the breeding and trap-nesting of Runner Ducks, and his "Just Laid" and "Palace" strains are perfection for all that is best in egg-production. Literature on the management of Ducks may be had free from Mr. Taylor.

Home-made Fountain.—Place an upturned jam jar in a saucer, having first knocked a small Λ-shaped hole in that part entering the water. Having filled the jar with water, place the saucer over the top; then reverse.

The Coming of the Audlem.—A variety that is deserving of popularity is the Audlem, originated by Mr. J. R. G. Smith, of Audlem, Cheshire. Mr. Smith has confided in me the secret of how the Audlem came into being. One or two Minorca hens persisted in flying over into the next Rhode Island Red pen, resulting in golden-pencilled crosses. Some of these were mated to a Buff Rock cock, and others to a Croad Langshan, and the golden-pencilled specimens of both matings crossed together. Mr. Smith has in the Audlem a non-sitting variety, but he is fixing the "brown" egg, which when fully accomplished must create a record.

Chicks and Drowning.—Chickens often fall into the drinking-vessels from the hen's back and get drowned. Use shallow vessels to prevent this, or place a large pebble in any open vessels so that the chicken can feel its feet and hop out before getting drowned.

Lectures on Poultry-keeping.—At the moment many well-to-do ladies and gentlemen are encouraging local producers to keep poultry. Nothing is more helpful to these workers than an occasional lecture and demonstration. Mrs. A. J. Pain, Heath Park House, Leighton Buzzard, Beds., undertakes such lectures, and in each instance the local Red Cross benefits.

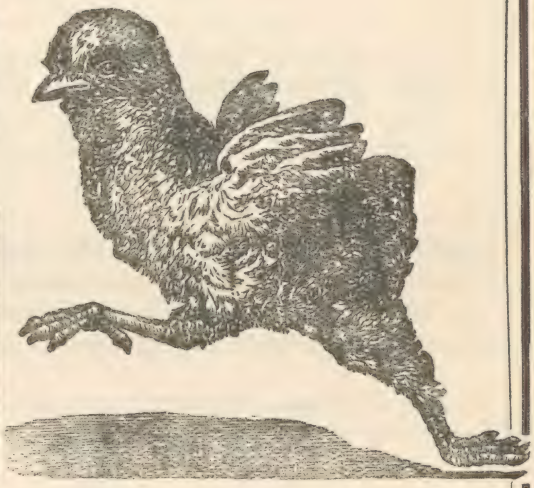
NO DEAD CHICKS

OUR MOTTO FOR 25 YEARS.

MAKE IT YOURS
BY USING

ARMITAGE'S DRY CHICK FOOD.

Every Chicken that lives will help to increase the food and egg supply of the country and be a profit to YO U.
A DEAD CHICK IS A DEAD LOSS



To make your Poultry pay you must rear every Chick, and the only sure way to do this is to feed them for the first three weeks exclusively on Armitage's No. 1 Original Dry Chick Food, and follow on with Armitage's No. 2 Grow-on Chicken Mixture and Armitage's No. 3 Small Chicken Food.

Send post card for Sample, Price List, and Book on Poultry Rearing, POST FREE.

ARMITAGE Brothers, Ltd.,

Poultry and Game Food Specialists,

NOTTINGHAM.

Use of the Oven.—Place odd bones in the oven and then pound up and add to the soft food twice a week. Treat stale crusts of bread in the same way as a change.

Britain's Best.—Mrs. A. J. Pain, of Heath Park House, Leighton Buzzard, Beds., is well known in poultrydom, specialising in "Britain's Best" in Blue Leghorns, White Leghorns, Rhode Island Reds, and Runner Ducks. As a breeder, exhibitor, and exporter, Mrs. Pain has made a good name, also as a lecturer, her poultry lectures benefiting the Red Cross in the districts where they are given. Those needing a thorough training in poultry farming will receive the same on Mrs. Pain's farm, which is Intensive, Semi-Intensive, and Free range, and situated only 40 miles from Euston. Popular strains are kept, and Mrs. Pain is a thorough enthusiast, being a member of the Poultry Club, S.P.B.A., U.D.C., and National U.P.S., whilst she is also vice-president of the Blue Leghorn Club. With the Blue Leghorns she has become well known both at home and across the water, and trap-nests are used on the farm to ensure laying power in the strains. Pedigree rabbits are another speciality of this lady-breeder.

Beware of Pussy.—Pussy will always pounce upon the best chicken of any brood if she has the chance. Use thin-meshed wire-netting along the bottom of all chicken runs.

Poultry Raising on Big Lines.—I have, as far as space permitted in this book, touched upon poultry-raising on big lines. Messrs. R. Toope and Co., Stepney Square, London, E., deserve a meed of praise for the interest they have taken in this particular cult. They have perfected the Mammoth Incubator and Mammoth Brooder-house, and now one can order from this firm an incubator to hold as many as 25,000 eggs, or a Brooder-house to accommodate 800 chickens. Every reader of this book should send for this firm's poultry guide, for it is such an interesting work and touches upon practically every accessory or appliance used in the Poultry cult.

Administering Medicine.—To give a fowl medicine place the invalid in a smallish box, placing the left arm across the back of the fowl and opening the mouth with thumb and finger. With the right hand give the medicine.

An Ingenious Invention.—The "Triumph" incubator as manufactured by Mr. William Lea, Royal Appliance Works, Birkdale, Southport, is an ingenious invention. It is neither a Tank machine nor a Hot-air machine, the heat being supplied by a boiler and circulating pipes to give a uniform temperature in every part of the egg-chamber.

ANYTHING

AND

EVERYTHING

Required by the POULTRY-KEEPER

May be had from

Harry HEBDITCH,

Martock, SOMERSET.

BRITAIN'S PREMIER POULTRY APPLIANCE MANUFACTURER

Send for his free Catalogue.

This, it is contended, is guaranteed by the hot water continually circulating through the pipes all round the machine. The chickens when hatched make their way to the nursery shelf unassisted, and the operator can view the egg tray from the outside without opening the doors. The "Triumph" incubator, as has the "Triumph" foster-mother, has a world-wide reputation, having won very many silver and bronze medals at the leading agricultural and poultry shows. One could not meet a more amiable personage than Mr. Lea, who is to be seen at most shows, going fully into details regarding incubation for the guidance and benefit of any passing novice fancier. I have often been asked where a perfectly "safe" oil could be bought. An oil I have used with great satisfaction is the "Triumph," which will not ignite below 300° F., and which has a boiling-point about 550° F. With a flash point of over 200° F. this oil is to all intents and purposes non-explosive. For fosters and incubators it is excellent, the absence of smell and smoke enhancing its value.

Handy Reference Books.—When you read a good "paragraph" don't commit it to memory, but cut it out and paste it in a note-book. Ordinary note-books are suitable for such cuttings, and the pars. can be arranged alphabetically.

Importance of Trap-nesting.—To breed heavy egg-producers trap-nesting is essential, but a simple and reliable trap-nest is essential. One I have always praised is the "Never Fail" invented by Mr. Thos. Eaves, of 220, Eaves Lane, Chorley, Lancs. So well-designed is it that the trap-nest cannot get out of order; hence its name. The trap cannot fall till the hen has entered, the door or shutter being normally retained in its open position by a "stop" connected with the movable floor, the weight of the hen imparting movement to the floor thus removing the stop from the door or shutter, which drops to a closed position. The nest-bottom can be taken out in a second for cleaning purposes—a decided advantage.

When Giving Swedes, etc.—When giving swedes or similar roots, drive a large nail through each into a stout piece of wood. The fowls can then peck out the centre of each root.

Healthy Poultry.—Success in Poultry Husbandry is only possible where health in the chicken or adult yard reigns supreme. Izal preparations, as manufactured by Messrs. Newton, Chambers and Co., Ltd. Thorncliffe, near Sheffield, will ensure healthy poultry stock, and the medicine chest should never run short of such. The Izal disinfectant powder is an excellent insecticide for dusting amongst the feathers of the birds or for use in nests, etc. Izal soap is extensively

used for washing fowls. Izal fluid (white) is not only a powerful germicide for use about the premises, but also most valuable for giving internally. Izal veterinary fluid (black) is a powerful combined insecticide and germicide. Wherever live stock are kept—whether fowls, dogs, or pet mice—Izal preparations play the part of the Panel Doctor.

Dry-Mash Feeding.—This is more or less a novelty in Great Britain, and even yet many are against it and base their opinions on the following faults and disadvantages of the system when first introduced :—

(1) Unless several different sizes of hoppers or troughs were used it was impossible to feed all sizes of fowls from day-old to full grown stage without great waste of mash. With war prices ruling for all feed stuffs this was a very serious matter, and was not by any means balanced by the labour saved.

(2) In order to remedy this fault attempts were made to make hoppers of a compromise size, *i.e.* the so-called "happy medium," but like all halfway measures they could not be considered a success.

(3) In the endeavour to make these happy mediums, poultry men found themselves faced with the dismal fact that owing to necessary alterations in designs the half-grown and adult birds could not feed from the troughs without rubbing their heads against the hoppers. This invariably led to introducing "bald heads" or "favus," a parasitical complaint which strips the bird's head and neck of all its feathers. With anything over a dozen or so fowls, individual treatment of the complaint was quite impossible, and as the disease spreads very rapidly, only a few weeks are required to render a whole flock an eyesore, and of course this depreciates their sale value.

(4) A still more important fault in such hoppers was the fact that the mash was prone to clogging or packing, which meant that the poultry man never knew for certain whether his birds were getting their due allowance of mash per day or not.

Provided that the novice goes in for an up-to-date and properly worked-out hopper these faults are all a thing of the past. For instance, Mr. Burn-Murdoch's patented hopper, which he has perfected during a continuous six years' use in his own yards, and which is advertised in this book, entirely fills the bill. This B-M. hopper is adjustable as to the depth and breadth of the trough, as also its height from the ground. With day-olds it is placed on the ground with sundry boards not then required for adult birds fixed as a flooring or platform on which the youngsters run about freely when feeding. At dusk the trough lid is closed down and long before morning the chickens have "cleaned up" any small amount of waste from off this clean floor. It is a sight to see one of these hoppers so feeding several hundred day-olds all lined up like a cavalry regiment.

Telephone CRAY 7. (Established nearly 50 years)

WILLIAM COOK & SONS

(Originators of all the Orpingtons)

ST. MARY CRAY, Kent.

ARE NOW SUPPLYING

RELIABLE EGGS for HATCHING

BUFF ORPINGTONS ...
WHITE ORPINGTONS ...
WHITE WYANDOTTES
RHODE ISLAND REDS
HOUDANS ... ...

LIGHT SUSSEX ... ...
SPECKLED SUSSEX ...
WHITE LEGHORNS ...
BLACK LEGHORNS ...

CLASS I.

From excellent utility stock—**Trap-nested** strains producing from 210 to 248 eggs each in the year.

10/6 per Dozen.

CLASS II.

From specially selected birds of perfect colour and type—all of the above trap-nested strains.

15/- per Dozen.

CLASS III.

From first-class pens of birds, to produce winners and high grade stock when the demand for these is again forthcoming. **15/- per Dozen.**

Customers are asked to specify from which class they require the eggs as these are absolutely distinct.

All eggs are produced by hardy birds which are in perfect health and of outstanding stamina.

RELIABLE DAY-OLD CHICKENS.

Orders are being booked for forward delivery on different dates:

From Class I. ... ... 21/- per Dozen.
From Class II. ... ... 30/- per Dozen.
From Class III. ... ... 30/- per Dozen.

Safe Delivery guaranteed in England and Wales.

Terms cash with order.—

No Eggs or Chicks are supplied on any other terms, and no reductions for numbers.

The quality of the stock at St. Mary Cray is unequalled on any other farm in England, and everyone placing orders with the oldest firm in the business can rely on having the finest value obtainable.

Their object is always to secure repeat orders and they have thousands of eggs booked from former customers now.

FOODS FOR REARING OF FINEST QUALITY SUPPLIED.

All orders should be carefully addressed to

ST. MARY CRAY, Kent.

NATURE has endowed hens with plenty of eggs, but poultry-keepers do not use the right food to develop these, consequently they keep their birds for about six months in the year for no return, so that those which are produced during the remainder of the period have to be relied on as the sole return for the year's outlay.

WILLIAM COOK & SONS

WHO ARE THE

Originators of the Orpington Fowls and Ducks, and the largest breeders of Poultry in this Country, whose one address is

ST. MARY CRAY, Kent,

have solved the question of profitable egg production for all—for it was necessary that they should get eggs from their own large stock of birds (5,000 head always mated up for breeding purposes), and they are now offering to farmers and poultry-keepers the food to which they attribute their own success—and this is their

IDEAL MEAL

which they supply in two forms:

(1) For use with Sharps, etc.
(2) As a Complete Food.

Their system of feeding is effective and economical, and it is the only one which develops eggs without the birds becoming over-fat in the process.

A TRIAL WILL CONVINCE THE MOST SCEPTICAL OF ITS VALUE.

The price of the Ideal Meal is:—per cwt., 21s.; per ½-cwt., 11s.; per ¼-cwt., 6s.; Carriage paid in England and Wales.

For a few fowls a 6*s.* bag, or for twenty or more one at 11*s.*, will prove that this is the egg-producing, health-promoting food everyone who is a poultry-keeper has been looking for for years.

This is the food made by the largest poultry breeders in England, and it is used by thousands with great success.

Reliable Eggs for Hatching and Day-Old Chicks always for Sale.

(*See opposite page.*)

Three penny stamps to defray postage will secure their current advice on poultry-keeping on mentioning this publication.

All letters must be sent to their **ONLY ENGLISH ADDRESS:—**

WILLIAM COOK & SONS,

ST. MARY CRAY, Kent.

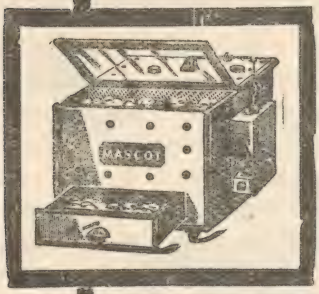
Telephone: 7 Cray.

As the chickens get larger the hopper is raised on its adjustable legs to any required height, which prevents the litter being scratched into the trough. At the same time small adjustments are made so as to increase the rate of mash fed from the magazine, as also the depth and length of the trough itself. Similar adjustments are made as the birds grow in size, until, as fully grown pullets or cockerels, the trough and its two perches are some 30 inches from the ground. The hoppers being placed some distance from the water supply the birds are forced to jump off and go for a drink every few moments, their places being immediately taken by other less thirsty ones. This routine obviously compels even the laziest bird to take considerable exercise while, at the same time, it practically doubles the hopper's feeding capacity. No tools are required for adjusting the hopper and any child can make the adjustments in a few moments without emptying out the mash. If one reckons up the time that a wet-mash man with 20 or so fowls takes to cook and mix his mash, clean up utensils and troughs, measure out the required allowance per pen, and to stand around seeing that each hen gets its allowance of food, it will be seen that Mr. B-M.'s contention that such a man wastes some eight hours a week is not very wide of the mark.

With dry mashes, it is contended, it is practically impossible for the greediest of hens to gorge itself. Not a hen can eat the dry mash for more than a few moments without having a drink, so this fact alone settles all trouble about timid hens not getting their share. As for the results in eggs, Mr. B-M. has for years fed nothing but dry rations from day-old to the pot, and one of his pens containing 34 birds has averaged close on 200 eggs, and on 3 consecutive days laid 50 per cent., 100 per cent., and 52 per cent. Any one who has tried to get 34 eggs from 34 hens in one day, let alone 50 per cent. on either side of the score, will, I think, grant that Dry-Mashes fed from properly designed hoppers, which only need to be filled twice a month or six weeks, compel attention from the progressive poultry-keeper.

Dispensing with Broody.—One of the cleverest machines that have come under my notice is the Combined Incubator and Duplex Rearer invented by Mr. Leonard Bond, Glossop, Derbyshire. This wonderful appliance is really three machines in one: (1) incubator, (2) hot-air brooder, and (3) cool brooder. Its important feature lies in the fact that the chicks can be hatched and reared to the age of six weeks at the *one cost for hatching eggs*. Apart from the labour saved, we must take into account the saving in cost of rearing, in ground space, and in broodies. Broodies are dispensed with, so that the owner can reap the full value from *all* his hens by way of eggs. As I have pointed out, broody periods reduce the profits; hence the advantages of the Bond patent Combined Incubator and Duplex Rearer.

F. BURGESS. THE NEW POULTRY SYNDICATE



The "MASCOT" Incubator.

No. 1 size—30-36 eggs £4 2 6
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The "Mascot" is built throughout of the best materials only. It is reliable in working and handsome in appearance. Will hatch every hatchable egg with the minimum of attention.

Testimonials from our customers, published in our catalogue, support every statement we make.

The "TIMES" Incubator.

No. 1 size—30 eggs £3 3 0
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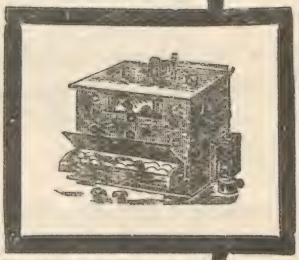
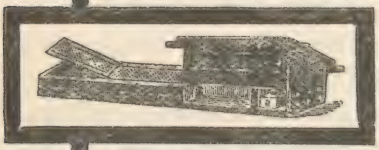


Is easy to work and will last a lifetime. Fitted with solid Copper Tank, Lamp with patent Burner, Best English Thermometer and Regulator. The same inside as the "Mascot," but the outer case is not so expensive. Full instructions.

The "SPHINX" Rearer. 50 Chick size, 29/6.

WITH RUN AS ILLUSTRATION 35/-



It is durable, reliable, and will rear any rearable chick. Strong, well finished, and roof covered in addition with patent felt. An English Rearing Thermometer included. Full instructions.

THIS IS ONE SIZE OF OUR FAMOUS **"STAMFORD" House.**

5 ft. × 3½ ft. × 4 ft. ... £2 13 6 carriage paid.

Without equal at the price.

The fullest possible description of these goods is given in our catalogue. It shows also Portable Houses of all sorts. Other Rearers, Motor Car Houses, Bone Cutters, Grit Crushers, Coops, Marking Rings, etc. In short, everything for Poultry Culture is to be found in our Illustrated Catalogue. It is FREE and POST FREE.

The N.P.S. (Dept. C.) F. BURGESS,

CLONBROCK ROAD, STOKE NEWINGTON, **LONDON, N. 16**

Along the Road.—An ample supply of dandelions, chickweed, grass, and stinging nettles can be obtained along the roadside. Boiled stinging nettles are good for the blood.

Feeding for Eggs.—I always like the "Old Calabar" way; it is always thoroughly sound like their well-known foods. As I write I have before me a very helpful booklet showing how the "Old Calabar" foods should be used, and as this book of hints is free on application, there should be a request for same from *you* without delay to Old Calabar, 28, Chapel Street, Liverpool. The foodstuffs supplied comprise "Pecko" and "Chicala" as the grain mixtures; "Laon" the mash prepared to the formula recommended by the Harper Adams Agriculture College, where the Laying Contests are held, and "Poultry Meal," which is used with the "Laon" and vegetables. Other foodstuffs include Old Calabar Palm Kernel Meal, Meat-meal, Fish-meal, Meat-and-Bone-Meal, and Clover Hay Meal, whilst a speciality is made of shells, grit, and charcoal. You can start with the best fowls and houses that money can buy, but you will not then get full egg-baskets unless you feed correctly.

Square Runs Economical.—When constructing a run remember that a square enclosure taking up the same amount of netting as an oblong one has the advantage of giving more ground for the fowls. Try it!

Farm of 160 Acres.—A poultry-farm that has come very much into the limelight of recent years is the Holdfast P.F., Haslemere, Surrey, owned by Mrs. John Farnham. Knowing as I do how the farm has been built up regardless of expense, I can confidently recommend the strains kept in the various breeds. A few seasons ago Mr. Alan Storey's White Orpingtons won all before them on the show bench, as did, too, Mrs. Lycett Green's champion White Rocks. When these two fanciers retired from the Poultry World their studs were purchased at a large figure in each case by Mrs. Farnham. Many breeds are specialised in, including the noted Light Sussex, which variety I have highly recommended. Utility birds of the finest strains are quartered on this farm of 160 acres, and the fact that one, ten, hundred, or a thousand birds can be supplied speaks for itself. Eggs, day-old chicks, and stock-birds—both Utility and Fancy—are specialised in, and pupils are received at the poultry manageress' house, where all branches are taught. Personal attention is given to all orders received, and I am sure no keener poultry-farmers could be named than Mr. and Mrs. Farnham. White Leghorns, White Wyandottes, and Aylesbury Ducks are also kept.

DO YOU REQUIRE?

Eggs that will hatch

Chicks that will thrive

Pedigree Pullets that will lay

Cockerels that will "throw" heavy layers

Breeding Pens to produce heavy-laying strains

IN

White Leghorns

AND

White Wyandottes.

IF so you must have the **"GORDON GRAY"** strains. Every layer on the farm is trap-nested, and only those with the heaviest records are used in the breeding pens. Every male used is from a heavy record 200-egg-or-over dam, and all matings are strictly on modern and egg-producing lines.

THE **"GORDON GRAY"** strains are noted for size of egg, tip-top fertility, hatchability, rearability, stamina, vigour, and prolific egg-production. No matter whether you are a backyarder, poultry-farmer, hobbyist, farmer, Intensivist, or small-holder, you need the **"GORDON GRAY"** strains if you want

EGGS, EGGS,

AND STILL MORE

EGGS.

SPECIALITIES: **Sittings of Eggs; Day-old Chicks; Pedigree Stock Pullets & Cockerels; Stock Adults & properly-mated Breeding Pens.**

G. GORDON GRAY *Deansbrook Poultry Farm, Edgware, Middlesex.*

(Prices and full particulars of Strains on receipt of enquiry.)

To Render Eggs Unfertile.—If dipped in boiling water or pricked with a needle, eggs may be rendered unhatchable.

British Biddy Abroad.—It requires a deal of confidence in one's laying stock to send representatives across the water to compete against America's, and in fact the World's, best layers. Yet Mr. Tom Barron, The Poultry Farm, Catforth, near Preston, has frequently sent his pedigree White Wyandottes and White Leghorns all the way from Lancashire to the States only for them to come back with laurels. With what amount of interest the doings of our English representatives have been followed by all British poultry-keepers can well be guessed. The successes of his birds in English and American Laying Competitions open to the world are :—42 silver cups, 4 gold medals, 35 silver medals, 52 200-egg ribbons, 11 first prizes, and 11 second prizes. Mr. Barron has often remarked to me, "My catalogue is my silent salesman."

One Cause of Egg-Eating.—One cause of egg-eating not usually quoted is the irregular collection of the eggs from the nests on the part of the owner. An egg gets broken and the vice is the result.

The Busy-body Ancona.—A breed that deserves popularity is the Ancona—an active, busy-body breed, a small eater, splendid forager, and excellent layer. An excellent laying strain of Anconas is kept by Mrs. Shortt, of Southwick Rectory, Sunderland, who has always given special attention to egg-production. Rosecombs as well as single combs are bred, the former especially for winter-laying, as many contend that Jack Frost cannot "nip" a neat rose comb. The Ancona can be kept successfully on free range quite as well as in the backyard run or Intensive house, and there should be a much greater call upon this active little breed. Eggs for sitting, chicks, and stock birds may be purchased.

Laying from the Perch.—It often happens that a hen persists in laying her eggs from the perch whilst at roost. To prevent such eggs from breaking it is a good plan to keep the soil under the perch soft and scratchable.

14,484 Eggs in Six Months.—For 250 hens to lay 14,484 eggs in six months, and from November to April at that, is certainly excellent. The results speak volumes for the Game and Poultry Spice—as sold by Mr. Roger Errington, of Victoria Mills, Sunderland—which takes the credit in the case referred to. This spice is prepared with great care and is highly recommended for young stock as well as laying hens or pullets about to lay. Cleanliness in housing is all-important, and a near cut to this is through Mr. Errington's Pine Fluid Soap which is extensively used for washing and disinfecting poultry houses.

HOW LONG WILL A CHICKEN HOUSE LAST?

It is a waste of money and time

to erect Chicken Houses

unless they are covered with genuine

Weather Resisting Paint.

VICKERS' WEATHER RESISTING PAINT

One Tint only—
RED BROWN.

1 gall. Can 16/-
2 „ „ 30/-
5 „ Drum 60/-

Package Free
on Rail, our London Works.

1 GALLON WILL COVER ABOUT
700 FEET SUPER.

Woodwork quickly rots unless protected from the elements. If you desire to whitewash your chicken houses from time to time, **paint** the woodwork **first** two or three coats of Weather Resisting Paint, allowing each coat from one to two days to dry off before applying the next coat.

Every year wash off your limewash with two or three good washings of water, give one coat of Weather Resisting Paint and proceed with your whitewash as usual, and—

Your Chicken Houses will last your lifetime.

ARCHIBALD VICKERS, LTD.,

Paint and Varnish Manufacturers,

28, KING STREET, COVENT GARDEN.

The Nest Boxes.—It is always advisable to place the nest-boxes in a dark part of the house. Layers, especially young pullets, appreciate privacy when contributing to the egg-basket.

Home-bred Winners.—Much credit is due to a poultry-keeper who wins important prizes with "home-bred" stock. In the first place, it shows that high-class birds were started with at the beginning; and in the second, that the breeder has paid especial care in breeding, feeding, management, and attention to details. If these attributes were missing, Palace winners would produce "wasters." It has always been Miss Champion's pride that her "home-bred" birds have won honours at the leading shows—Royal Lancs, Dairy, Manchester, Haywards Heath, etc. Buttercups, Rhode Island Reds, Blue and Black Wyandottes, and Black Leghorns are Miss Frances Champion's favourite breeds quartered at Heather Hall, Leicester. Utility strains are also kept, and White Leghorns have this season been added.

The Shy Pullet.—Pullets are shy creatures when commencing to lay. To encourage them to lay place a few dummy or china eggs in the nests when the pullets reach maturity and look on the point of laying. A pullet reddens up in head-points when about to lay.

Two Popular Breeds.—Two of the most popular breeds of to-day are Rhode Island Reds and White Wyandottes, both of which are the favourite varieties of Mrs. W. B. Goode, Aldborough Lodge, Boroughbridge, Yorks. This lady-breeder has won hundreds of prizes and birds of her breeding have time after time graced the boards at the Dairy, Palace, and other classic events. An enthusiast all over where live-stock are concerned, Mrs. Goode is a member of committee of the Rhode Island Red Club, and a member of the Poultry Club and White Wyandotte Club. Pedigree goats of a good milking strain are also kept, and Mrs. Goode is a member of the British and Utility Goat Societies. The Anglo-Nubian is the breed specialised in, and this variety is noted for its very rich milk and for its docility.

Helping on the Moult.—It is a common practice to give exhibition birds warm baths when the owner wishes to speed or bring on the moult.

Good-looking Layers.—There are layers and layers, as readers are aware, and Mrs. F. Appleyard, of Austhorpe House, Forncett St. Peter, Norfolk, has always aimed at not only a good layer, but also a "good-looking" layer. Although East Indian Ducks are kept, all-white breeds are specialised in. These include White Orpingtons, of a bred-to-lay strain, and White Wyandottes of heavy-laying type. The White Orpington is a breed that should be more popular, as it is not

A PAGE WORTH MARKING →

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"YOU are in safe hands in dealing with Mr. and Mrs. Hurt."
And numerous customers have said the same.

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WRITE TO-DAY ABOUT OUR

ANCONAS
noted for eggs, hardiness and prizes.

WHITE LEGHORNS
of highest pedigree egg strain.

WHITE RUNNER DUCKS
for eggs and exhibition.

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WINTER EGGS

YOU MUST USE OUR

MEAT MEAL AND CLOVER MEAL

IF YOU WANT

EGGS, ALWAYS EGGS

WRITE FOR

"EVON" POULTRY FOODS
(Samples 3d., post free).

THE SECRETS OF OUR SUCCESS

1. Our birds are reared on free Derbyshire hills.
2. We specialise in egg-production.
3. We are Millers and Manufacturers of all kinds of poultry foods.
4. The foods we sell, we use.

MR. & MRS. ERIK F. HURT, SOUTH DARLEY, MATLOCK.
Members of Poultry Club, National Utility Poultry Society, &c.

given to broodiness to any excessive amount. In a letter to me Mrs. Appleyard speaks of her experiences with poultry in Northern British Columbia, where owing to most adverse conditions—cold and snow—the fowls had to be confined for six months of the year. The fact that she was always successful and obtained eggs when others had none speaks volumes for her able management.

Night-lights.—To ensure full egg-baskets many poultry-keepers in the winter keep a small safety-light burning in the sleeping house during the night to warm the atmosphere and make the hens comfy.

Eggs that Count.—Mr. J. Godwin Edwards, who controls the Poultry-food Department of Messrs. White, Tomkins and Courage, Ltd. (48, Mark Lane, E.C.), has his finger well on the pulse of poultrydom. He is a great advocate of correct feeding where egg-production is concerned, and puts his ideas into practice by providing selected and nicely blended meals for poultry-keepers. "Clarendo" meals are widely known, and two prominent specialities of this firm comprise the "Malto" Malted Laying Meal and the "Maltash" Malted Dry Mash. The former is a super-standard food consisting of cereals blended with malt extracts, granulated meat and "Vido." Middlings and bran can be added. "Maltash" is a complete standard food that requires no addition and contains clover-meal, meat, and malt. Both meals can be used for either dry or moist feeding.

Waterproofing Calico.—A good method of waterproofing calico is to take three quarts of linseed oil, six ounces of resin, and two ounces of sugar of lead. Grind the lead with a little oil, then add the rest of the oil and also the resin. Place the whole in a pot over a gentle fire and stir well. Stretch the calico taut and nail to the framework, then apply the hot mixture with a brush.

Hardy and Fit.—Manage a laying hen almost as you would an athlete. Avoid over-feeding, as the hardy and active bird is THE layer.

Reds of Smalley Farm.—Many interesting visits have I made to Smalley Hall, Derbyshire, to see Mrs. Swingler's wonderful stud of Rhode Island Reds. It is to this neatly-planned establishment that I refer elsewhere in the book, where I praise the method as adopted of painting the wood-work to houses and runs a medium red to show up the lustrous red-plumaged inmates within. Only Rhode Island Reds are specialised in at Smalley Hall, and without a doubt the old saying "From small beginnings . . . etc.," is very true in the case of Mrs. Swingler, for originally only a few Reds were kept for egg-production, but the day came when a Red expert told this keen lady-hobbyist

To be successful it is necessary to Start on Right Lines

Therefore purchase your Eggs for hatching Day-old Chicks, Pullets or Stock birds from the Great Farm in the Healthy, Breezy, Pentland Hills, Scotland—Britain's Largest and most up-to-date Poultry Farm, comprising over 150 acres exclusively devoted to Poultry :

£10,000 has positively been invested in New Plant and Stock during the last three years

Established and enlarged for the sole purpose of supplying the right goods at right prices on honest, straightforward business lines that will secure your repeat orders and whole-hearted recommendations :: :: :: ::

Thousands of mated birds—everyone a selected specimen, true to type and colour and with a big laying record : :: :: ::

WHITE & BLACK LEGHORNS **RHODE ISLAND REDS**
BUFF ORPINGTONS **WHITE WYANDOTTES**
LIGHT SUSSEX **SALMON FAVEROLLES**

From 5,000 to 7,000 Chickens hatched each week during Season

Write at once for our catalogue which includes £1,000 Guarantee on every Egg for Hatching Day-old Chick, Pullet or Stock Bird purchased from us

ADAMS & LINKIE

Romanno Bridge Poultry Farm,
WEST LINTON, SCOTLAND

TELEGRAMS - - "LINKIE, MOUNTAINCROSS."

that her birds were exceptionally true to type and advised the purchase of exhibition birds. This advice was followed, and the original hen that founded the Smalley Hall stud, as it were, *laid an egg every day for eleven weeks.* Thus whilst Mrs. Swingler's birds now win at all the leading classic shows in the country—" home-bred " representatives, too—utility points have been " fixed " in the strain.

Home Producers' Opportunities.—Poultry Husbandry has certainly taken a new lease of life, and cries out for new and common-sense methods. In days gone by people used to preach that egg-farming did not pay, but this was *then* erroneous, and is *now* more so. The production of eggs for the market affords ample opportunities, and it is a case of now or never since the European crisis has shown up the faults of the past. Egg-boxes are essential, whether the poultry-keeper is in a small or large way, but reliable boxes must be purchased. Mr. James Marshall, of 12, Regent Quay, Aberdeen, has always specialised in reliable egg and chick boxes, and his makes are extensively used by egg-handlers. Those interested in the eggs-for-sitting trade will find several designs to please, as will the person engaged in despatching day-old chicks to customers. Those of my readers who send from 1 dozen to 60 dozen eggs to market at a time will find that the special points of Marshall's Simplex and Duplex egg-boxes are such as to merit their use.

Your own Formulas.—Messrs. Dobbie and Co., Waverley Works, Leith, are nothing short of progressive. In addition to supplying food-stuffs they make up meals to any formula by breeders. If you are in favour of certain mashes, all you have to do is to send particulars of the ingredients to this firm and let them supply them ready made. Stop and think what that means. Supposing you were using six ingredients in your mash. You will see at once that you will need time to mix them and storing room for the lot. And any mash depends upon the thoroughness of mixing for its success. You will then agree that it saves much time and labour if you can drop a line to Messrs. Dobbie and Co., asking them to supply a ready-made mash to your formula. Their Waverley Laying Meals and Dry Mash are made to a 1 in 4½ ration, and in addition to Dry Chick Feeds and Frame Food Meals, they supply clover-meal, fish-meal, meat-meal and the " World's Best Grit." Quality is the leading feature and " second to none " the firm's motto.

To Drown Paraffin.—To prevent paraffin from swimming on the top when being used in limewash, mix it with an equal quantity of boiled milk.

More Eggs—More Profit

¶ In every form of human endeavour, someone usually stands conspicuously first, and the World Leader in Laying Strains is unquestionably Tom Barron.

¶ The laying power of his strains is evidenced in the great laying competitions, which warrants the belief that in buying

TOM BARRON'S
White Wyandottes & White Leghorns

YOU GET THE BEST.

His Successes in English and American Laying Competitions open to the World are :—

42 Silver Cups
4 Gold Medals
35 Silver Medals
52 200-egg Ribbons
11 First Prizes
11 Second Prizes

¶ British Laying Strains are the best in the world, and no man has done more to make them so than Tom Barron.

¶ The Tom Barron way is the paying way, more eggs—more profit.

¶ Send for catalogue—his silent salesman—it gives you evidence to back every word, and it is yours for a postcard.

TOM BARRON,
The Poultry Farm, Catforth, Nr. Preston.
ENGLAND.

Ped-Ad.

Some Noted Reds.—By far the most noted stud of Rhode Island Reds is that now owned by Mrs. Harcourt Vernon, and quartered at Coney Green P.F., Grove, Retford, Notts. Prior to being taken over by Mrs. Vernon, who secured the whole stud from Mrs. Cooper of Culland Hall, Brailsford, the birds won everything before them at all the classic shows. Mrs. Cooper has done much good at home and abroad for the beautiful Red, and now Mrs. Vernon is "carrying on" the good work. Birds from four years' consecutive Palace and Club Show winners are offered, which is truly a phenomenal record of wins. On another page will be found the performances of the birds—both rose and single combs; and birds and eggs of this famous strain can be had in season on application to Miss Chambers, the well-known manageress, in whose keeping the stud is, and under whose care every effort is being made to improve both the birds and their egg-production.

Poultry House Builders.—Messrs. Barrett and Son, Ltd., 25, St. Andrew's Street, Cambridge, undertake contracts for everything that poultry men require. They are an old-established and reputed firm of poultry-house builders, ironmongers, glass, china, and hardware merchants, and readers can place any order their way with complete safety. They are makers of the well-known Burn-Murdoch poultry houses, trap-nesting duck houses, trap-nest boxes, grit boxes, mangel wurzel hoppers, chickweed racks, and galvanised water founts. Every requisite is supplied to those making their own houses, such as nails, bolts, felt, carpenters' and poultry-yard tools, paints, tar, creosote, etc. It will pay you to make friends with this firm. The proper care of housing is a *sine qua non* in poultry-keeping, and having had it pointed out in my text that poultry-yard tools are essential, you should not delay in asking Messrs. Barrett and Son the price of a complete outfit. If you have any difficult "erection" job, consult this firm!

Aiding Digestion.—A hen cannot lay eggs unless she is perfectly happy inside and out, nor can a young pullet or cockerel grow satisfactorily if its internal organs are out of pitch. It is because Colman's Poultry Mustard is so valuable as an aid to digestion that I recommend its use in mashes for stock of all ages. Wherever there is a strain on a fowl's or chicken's system, Colman's Poultry Mustard will relieve the same and put things right. The strain I refer to may make its presence felt during the moult, on cold wintry mornings, when the chickens are growing feathers, bone, or flesh, when the pullets are on the point of lay, after the hens have had a busy laying season, and midway between, etc. Half a pound of Colman's Poultry Mustard is sufficient for one hen for the six winter months.

Help Britain to keep her end up

BY BREEDING FROM STOCK POSSESSING
:: :: THE HIGHEST EXHIBITION :: ::
AND EGG-PRODUCING QUALIFICATIONS.

My Free Illustrated Catalogue gives full particulars of the following Breeds kept:

Rhode Island Reds.
Anconas.
Light Sussex.
Sicilian Buttercups.
White Wyandottes.
Speckled Sussex.
Russian Orloffs.
White Leghorns.
Barred Rocks.
Buff Orpingtons.
Brown Leghorns.
Buff Rocks.
and **Buff Orpington Ducks.**

Write to

MRS. CHRISTINE COLBECK,

Boyle Hall,
West Ardsley, nr. Wakefield.
England.

Books by the Million.—Any of my readers requiring books on horticulture, agriculture, poultry, birds, and *all other subjects*, should send a postcard to Messrs. W. and G. Foyle, 121/3, Charing Cross Road, London, W.C. 2, asking for Catalogue No. 378. Over a million volumes are kept in stock in strictly classified order, and whilst new volumes are offered at discount prices, second-hand books are supplied at half-price. This well-known firm is out to do business and save you *£ s. d.* Any book will be sent on approval for a week, and whether you want a child's school book or a rare volume you will find it listed. Send for Catalogue No. 378 to-day !

Milky Fresh for Six Months.—There is not the least doubt that in the future egg-preservation will play a very big part in "Home" production. It ought to have done so in the past, but for some reason or other poultry-producers, as was their wont, did not listen to the writings of the poultry experts. The European War has altered all things in Poultry Husbandry, and if an egg famine is to be averted egg-preservation must be extensively practised. Far too many have been ready to argue that summer eggs do not pay to produce, but I can assure them that if they only preserved such eggs they would find them as profitable to produce (if not more so) as winter eggs. Have they forgotten that the weekly food bill is smaller than that of the winter, the birds obtaining plenty of insect life and natural foods, that enable the poultry-keeper to produce eggs at a cheaper rate ? By the use of Boots' Egg-Preserver, new-laids can be kept milky fresh for six months. It is sold in tins at all branches of Boots, The Chemists, a small tin containing sufficient for about 200 eggs. The contents of a small tin—2 pounds—is added to 3 gallons of hot water, the mixture allowed to cool, when it is ready for use. Some breeders put down into Boots' Preservative as many as 36,000 eggs in a season. There is no limit to the number of eggs that can be preserved each year.

Reared Half a Million Chicks.—When ordering incubators, brooders, or poultry-houses from Mr. Robert Miller, Denny, Scotland, you are purchasing from a practical poultry-farmer with a wide experience of what both hens and owner require. Mr. Miller, it is said, holds the United Kingdom record as the largest hatcher of chicks, having actually hatched half a million of these little fluffy creatures. One can therefore rely upon his specialities, knowing that his houses, etc., have been put to personal test and not found wanting. In Miller's Patent Hot-air Incubator there are very many original features which account for its popularity, and these are very plainly put before the buyer—with illustrations and sketch—in Mr. Miller's beautiful *post free* art catalogue. I like to see originality in poultry-houses, and that

MRS. A. J. PAIN

Heath Park House, Leighton Buzzard, Beds.

(Member of the Poultry Club, S.P.B.A., U.D.C., and National U.P.S., Vice-President of the Blue Leghorn Club)

Breeder, Exhibitor and Exporter of

"BRITAIN'S BEST"

— IN —

BLUE LEGHORNS: Admired by Royalty. Handsome and sprightly, and regular Egg-machines. Will please you immensely.

WHITE LEGHORNS: No. 1 Pen, headed by Cockerel bred from *Tom Barron's* winners of the Burnley N.U.P.S., 1915–16 Competition.

REGULAR EGG-MACHINES IN WINTER & SUMMER

RHODE ISLAND REDS: *Golden's* strain. Wonderful layers and noted for their large rich coloured eggs.

RUNNER DUCKS: Fawn and White, and Pure White Indian Runner Ducks (*Upjohn's & Shaw's*). Marvellous layers of wonderful eggs.

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SPECIALITIES:

Eggs, Day-old Chicks & Ducklings, also Stock Birds & Ducks.
PEDIGREE RABBITS: Belgian Hares and Flemish Giants.

POULTRY KEEPING ON THE INTENSIVE SYSTEM

Price 6½d. post free. *Second Edition.*

WRITTEN AFTER SEVEN YEARS' EXPERIENCE.

By
MRS. A. J. PAIN

A few testimonials on the Pamphlet.

"By following your advice I have had 1,378 eggs from seven Leghorns in one year."

"The best book on the Intensive System EVER written."

"I wish you had written it a year sooner. By following your advice my egg supply has been doubled."

"All other books and systems of poultry-keeping were a 'weariness of the flesh' until I read your pamphlet. Now I am on the road to success. Please send me anything else you have written."

"No horrid decimals to worry one. Everything is worked out and made so simple. I cannot think how you sell anything so valuable for so small a sum."

PUPILS TRAINED ON FARM

Farm—40 miles from Euston — is Intensive, Semi-Intensive, and Free Range. Highest Testimonials. Moderate Terms.

Mrs. A. J. PAIN Lectures on Poultry Culture. Terms moderate.

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"COAXME" LAYING POWDER

The Marvel of the Age. Acts like a charm in making birds lay. Can only be had from Mrs. A. J. PAIN.
1 Packet **1/4** post free.
2 Packets **2/5** post free.
(One packet is enough for one dozen birds for six weeks.)

is why I have always had a good word for the "Paradise" poultry-house. This is a fine example of practical planning and high-class workmanship, and when first exhibited at the Dairy Show created quite a buzz of excitement, bringing, too, shoals of orders and later testimonials. For use as a breeding-house, colony laying-house, or Intensive laying-house, the "Paradise" is made in sizes to take from 15 to 140 fowls. Two other excellent designs of houses for field use are the "Pavilion" and the "Premier." The very latest—from Mr. Miller—is the "Pre-eminent" poultry-house—for Intensive, Semi-intensive, or Colony use—as introduced to the poultry public in this volume.

Portable Boilers.—If there is one thing more than any other that should find a place in the poultry plant it is a portable boiler. And the "Devon" Portable Boiler supplied by Messrs. McDowall, Steven and Co., Ltd., Falkirk, is recommended as being the cheapest, most sanitary, most reliable, most efficient and most economical in the market. It should prove a boon to all poultry-keepers. It can be erected in the food-house or in the open air when with a short length of pipe for a flue it will work quite satisfactorily. For steaming maize, scalding the mashes, scalding the drinking fountains and food-troughs the "Devon" is the thing, and on a poultry-farm it will earn its original outlay in a very short time. This firm also specialises in piggery fittings, pig troughs, heating stoves of every description, pipes, stable fittings, etc., and their descriptive catalogue should be in the hands of all who keep live stock, pigs, cows, horses, poultry, or what not.

Everything Supplied.—You may require a toe-puncher, a drinking fountain, an incubator, a foster-mother, or a duck-house or a poultry-house—whatever it is you will find it listed in the striking catalogue issued by Mr. F. Burgess, The New Poultry Syndicate, Dept. C, Clonbrook Road, Stoke Newington, London, N. 16. Incubators and rearers are quite a prominent feature as are houses, and you will find the prices decidedly reasonable. The "Mascot" and the "Times" stand out among the incubators, and they are just the machines for the small poultry-keeper incubating up to 115 eggs. The "Stamford" house is a well-designed structure that is very popular among poultry-keepers, but to know the good things offered is to see the descriptive catalogue which is sent free on application.

Sending Eggs to Market.—Every kind of dairy appliance is specialised in by the Dairy Supply Co., Ltd., of Museum Street, London, W.C., this firm's name being a household one with farmers throughout the world. Egg-boxes are not forgotten, and two very

BARRETT & SON, LTD.

POULTRY HOUSE BUILDERS.

Ironmongers, Glass, China, and Hardware Merchants.

25, ST. ANDREW'S STREET,
— and 30, MARKET HILL, —
CAMBRIDGE.

CONTRACTS undertaken for everything that poultrymen require. B-M. Poultry Houses, Trap-nesting Duck Houses, made in 10 ft. sections, B-M. Trap Nest Boxes, Grit-Boxes, Mangel-Wurzel Hoppers, Chickweed Racks, Galvanized Water Founts. Every requisite supplied to those making their own houses, such as Nails, Bolts, Roofing Felt, Carpenters' and Poultry-yard Tools, Blacksmith Work, Paints, Tar, and Creosote, &c.

Gt. Shelford,
Cambs., 22*nd Oct.*, 1917.

Messrs. BARRETT & SON, Ltd.,
25, St. Andrew's Street, Cambridge.

Dear Sirs,

I am glad to say that the orders you have executed for me during the last 12 months or more have been carried out most satisfactorily. In regard to those done for my pupils I can but say, that with the exception of two trifling complaints, which were at once adjusted, I have not received a single complaint.

This fact speaks for itself, as what with Freight troubles, &c., and "Rattled" Nerves due to War Strain, people are only too prone to "taking it out" of one with complaints about trifles.

Yours truly,
J. H. BURN-MURDOCH,
S.P.B.A., P.R.S., C.F.C.S.

popular and widely used designs are the "Aerolite" and the "Ventilator." The former is most useful, being very light and so showing a saving in carriage. Made in sizes from 2 dozen to 30 dozen, we find the latter weighs when empty but 18 pounds. The latter is so arranged that a current of air passes round the eggs when packed, preventing "sweating" and preserving the fresh flavour of the egg—hence its name. Both boxes are easy to fill, easy to empty, and the contents easy to count. Another egg-box deserving of special mention is the "Royal Mail," awarded the first prize at the London Dairy Show. It is highly recommended for conveying eggs by parcel post, and is made in three sizes, to hold respectively one, two, and three dozen eggs. The "Ventilator" egg-box holds from 1 dozen up to 50 dozen eggs.

Dry-feeding for Chickens.—The "dry-feeding" system for chicks is becoming more and more popular. In the United States it has always been popular, but in this country we are slow in following new ideas or even in experimenting. The system was introduced into this country by Messrs. Armitage Bros., Ltd., Poultry and Game Food Specialists, of Nottingham, and briefly consists of feeding the chicks from the very first up to the time they are a month old on a mixture of grains and seeds omitting all soft food from the dietary. There you have in a nutshell the system adopted by Messrs. Armitage Bros., whose Dry Chick Food is so extensively used by poultry-keepers to-day. The advantages claimed are a great saving of time and labour, more vigorous chicks, the chicks can take a feed little and often, and diarrhœa is guarded against. This firm issues a book on chicken-rearing which covers fully their system, and it should be in the hands of every progressive poultry-keeper. It is free for a postcard!

Black Mendels.—A breed that has just been introduced is the Black Mendel, full details of which will be found in Mr. Burn-Murdoch's advertisement. It has already caught on. Mr. E. A. Taylor, the "Duck" man, has also taken it up.

Eggs Insured in Transit.—When a firm makes good under guarantee any eggs that might be broken in their egg-boxes during the first twelve months after purchase, the buyer may be sure of the sterling value of the firm's specialities. Such is the guarantee given by Messrs. Dairy Outfit Co., Ltd., King's Cross, London, N., who manufacture the "Pocock" and "Cushion" patent egg-boxes. The strips of soft-hair felt in each division form a cushion and hold each egg in position without fear of breakage. Both makes hold from three dozen to eighty dozen eggs, and represent an excellent proposition for poultry-keepers who send eggs in quantities to market, whether individually or

492 EGGS IN 16 WINTER WEEKS

THE Six White Wyandotte Pullets which set up the above total in the Harper Adams Laying Competition are on my farm, and represent the foundation stone of my strain in this prolific egg-breed. During the sixteen winter weeks they averaged 82 eggs per bird, their egg-record sheet reading :—

HENS.

Period.	103	104	105	106	107	108	Total
Oct. 25 / Nov. 21	23	25	22	24	24	26	144
Nov. 22 / Dec. 19	22	3	23	23	17	11	99
Dec. 20 / Jan. 16	21	23	16	23	18	18	119
Jan. 17 / Feb. 13	21	17	25	24	25	18	130
						Grand Total	492

This pen with the above marvellous record made the

WORLD'S RECORD FOR WINTER LAYING.

YOU can follow the excellent advice given in this book, but if you do not procure the strains that can lay eggs you might just as well try to get blood out of a stone.

I CAN OFFER YOU BEST LAYING STRAINS, WHICH PROPERLY TREATED WILL GIVE YOU THE MAXIMUM RESULTS.

WHITE WYANDOTTES	LIGHT SUSSEX
WHITE LEGHORNS	RHODE I. REDS, S.C.
BUFF ROCKS	ANCONAS
RUSSIAN ORLOFFS	AYLESBURY DUCKS

EGGS FOR SITTING 7/6 10/- Per dozen.
DAY OLD CHICKENS 15/- 20/- „ „

PRICE LIST FREE.

JOHN E. SHACKLETON,

CHOLESBURY, Nr. TRING, HERTS.

collectively. In fact, that should be the system adopted by even small producers, viz. the clubbing together and despatch of eggs collectively to market. The "Thermos" foster-mother manufactured by the same firm is an entirely new method of heating without a lamp. This lampless mother maintains the warm temperature for rearing chicks for twenty-four hours or more. A cylinder of stout metal is charged with a substance in green crystals, which when once heated gradually radiates heat as from a living body and cannot be quickly cooled. Nor must we forget the "Standard" incubator with light inside for inspection of eggs and thermometer.

Universal Providers.—It is common knowledge wherever poultry matters are discussed that Messrs. Spratt's Patent, Ltd., of 24–25, Fenchurch Street, London, E.C., *provide everything for the poultry-keeper*. This is true in every sense, for it matters little what you require, whether foods, remedies, incubators, or appliances. "Mebo" is an entirely new food recently introduced, and has given wonderful results. Consisting of meat and bone, "Mebo" makes hens lay more and more eggs and may be had of all dealers in sealed bags—7 lbs. and 112 lbs. This egg-producing food that has compelled the attention of all big utility men, is freshly ground meat and bone, from which the excess fat has been extracted. We must remember, too, that a hen's food must be rich in albuminoids, as "Mebo," for Biddy to turn out her full complement of eggs in the shortest possible time. Hearson's Incubators and Foster-mothers are too world-famous to require detailed description. It is claimed for the Hearson "Champion" Incubator that it can be set at any desired temperature and will maintain that temperature for twelve months together within three degrees without adjustment. Can more be said of this champion hatcher that has been before the poultry public of the world for over thirty-three years? As to the foods, one can best sum up their merits by a visit to any of the classic shows where "miles of birds" are fed on Spratt's foods. Practical literature may be had post free from the above address.

Catching the Judge's Eye.—If a prize fowl is to catch the judge's eye and win the premier award it must be put down in beautiful-plumage-condition. An exhibit may be by far the best in its class, or the best in the show for all that, as regards *type and general points*, but if it is *badly shown or washed* it will not catch the judge's eye, but go cardless. Of three exhibits equal in other points except colour, the first-prize card will go to the best conditioned bird. "Lux" is ideal for use when washing fowls, improving the most delicate plumage. I have seen so many most beautiful "Lux-washed" exhibition fowls,

Holdfast Poultry Farm

HASLEMERE :: :: SURREY

Owner: **MRS. JOHN FARNHAM**

Breeders, Exhibitors and Exporters of
EXHIBITION AND UTILITY BIRDS OF THE FINEST
:: :: STRAINS :: ::

BREEDS KEPT INCLUDE:—

WHITE ORPINGTONS
(Mr. Alan Storey's entire Stud of Champions in this most popular variety is now in these yards).

LIGHT SUSSEX

WHITE WYANDOTTES

WHITE ROCKS
(Mrs. Lycett Green's Champions).

WHITE LEGHORNS
(Barron's)

AYLESBURY DUCKS

A Genuine Farm THAT CAN SUPPLY Genuine Birds—1, 10, 100 or 1000.

¶ All birds sent 3 days on approval—carriage forward.

¶ Stock birds always for sale at reasonable prices.

¶ Eggs and Day-old Chicks in season.

¶ Pupils received at Manageress' House. All branches taught.

¶ Terms—CASH with Order. Cheques crossed "Barclay & Co., Guildford."

¶ *'Grams*—"Holdfast, Haslemere." *'Phone*—167 Haslemere.

Apply to Manageress.

FARM—160 ACRES.

(Inspection Invited.)

and so do not hesitate to recommend Messrs. Lever Bros.' speciality. In fact, in practically all my writings on the preparation of fowls for exhibition, I have praised "Lux" and advocated its use. The "Lux" —two tablespoonfuls for every quart of water—should be placed in a tub or bath of boiling water and stirred till dissolved. Cold water must then be added to make the water luke-warm, and the bird may then be immersed in the wash and well lathered. If a little of Lever's Double-Distilled Glycerine is added to the rinsing water this will help the bird's feathers to web out soft. To be successful with poultry, clean housing is essential. The free use of Messrs. Lever Bros.' "Lifebuoy" Disinfectant Soap will keep the doctor away. Regularly scrub down the perches, nest boxes, and other internal fittings of houses or appliances with "Lifebuoy" and warm water.

300 Egg-strains.—Well do I remember how doubtful we were of the 200-egg-per-annum bird, and yet so rapid has the breeding of pedigree layers gone on that the 300-egg line has been passed. Mrs. Goodwin Preece, of Crosshill Farm, near Shrewsbury, possesses a 314 egg-strain in White Leghorns and a 311 egg-strain in White Wyandottes. Imagine the wonderful value offered in White Leghorns when it is borne in mind that her stock birds include cockerels and pullets sired by sons of the world's record hen "Lady Eglantine," her official egg record being 314 *eggs in* 12 *months* at the North American Laying Competition. At Crosshill, too, Padman's strain (imported direct) is also quartered, the sires used being sons of a 306-egg hen. All-white breeds are specialised in, White Orpingtons completing the trio, and here the strain is a 260-egg one and noted for the brown egg. All birds are trap-nested a full twelve months, and if you need eggs, chicks, or high pedigree cockerels in the breeds kept, a line to Mrs. Preece will find you fully accommodated.

School of Poultry Culture.—Those of my readers who desire a thorough tuition in modern poultry-farming should write Mrs. St. Johnston, Annandale Poultry Farm, and School of Utility Poultry Culture, Sutton Coldfield, near Birmingham. Here a thorough training can be obtained in the cult of poultry, table pigeons, goats, cows, table rabbits, ducks, and pigs. The incubator capacity totals 1200 eggs, and both day-olds and stock cockerels are supplied. A large proportion of the food is grown on the farm to save the food-bills, and altogether it is an *ideal* training centre. Mrs. St. Johnston also gives advice on poultry culture in all its phases.

Place Perches Low.—Never place perches too high from the ground, as a long jump is harmful to fowls.

My Birds were Top-Scorers

IN *THE* THREE ENGLISH LAYING COMPETITIONS IN TWO SUCCESSIVE YEARS.

WHITE WYANDOTTES.

BURNLEY, 1914-15.

Winners of **First Prize** in Open Section—Pullet Test—48 weeks. **Eggs Laid, 1254.** Market value, £6 10s. 0½d.

SPECIAL PRIZES,

for pen of THREE birds making **highest score** in Large House and Run Section. **Eggs Laid, 637.** Market value, £3 5s. 8½d. For BIRD making **second highest individual record. Eggs Laid, 245.** Market value, £1 5s. 4½d.

Winners of **First Prize,** Gold Medal, First-class Certificate. SIX BIRDS laid **1339** eggs. Market value, £7 6s. 7½d.

HARPER ADAMS COLLEGE, 1913-14.

WHITE LEGHORNS.

SEDDLESCOMBE, SUSSEX. 1913-14.

Winners of **First Prize,** Gold Medal, First-class Certificate. EIGHT BIRDS laid **1751** eggs—market value, £9 5s. 5½d.

These eight pullets laid only EIGHT eggs which failed to weigh 2 ozs. each.

Other Breeds Trap-nested:

BLACK LEGHORNS RHODE ISLAND REDS ANCONAS

Eggs, Chicks and Stock Birds in Season

Write for Illustrated Post-Free Catalogue of these Noted "LARGE-EGG" Strains.

G. B. Metcalfe,

Claydon Farm, Lechlade,

GLOUCESTERSHIRE.

Bred-to-Lay Anconas.—Mr. and Mrs. Erik F. Hurt, of South Darley, Matlock, have in their strain of Anconas amply proved that exhibition birds can lay eggs as well as win prizes. They breed to one standard only—the exhibition standard bred to lay by selection. Their birds have won at all the leading classics and in the past at Brussels International. Their wins at Birmingham of P.C. cup, P.C. medal, 2 specials, and 3 seconds with six Anconas, all bred from pedigree stock, tells its own tale, and some of the birds were bred from a 232-egg hen. The Ancona is a pure breed and not "made," and for exhibition is therefore only bred for perfection, egg-merits being in consequence fully maintained. Their stock are reared on open range on the Derbyshire hills, thus ensuring stamina, and White Leghorns and White Runner Ducks are also kept. Mr. and Mrs. Hurt are also millers and manufacturers of all kinds of poultry foods, selling those foodstuffs which they use for their own birds. Their "Evon" foods therefore claim attention.

Catching the Hen-Fever.—For many years now it has been my hobby to collect poultry-appliance catalogues. A rather unique pastime, readers will declare, but if they knew the interest and instruction these daintily got-up brochures provided they would understand and start a collection for themselves without delay. Some of these catalogues I prize, and one of the best in my poultry library for the current year is that of Mr. A. E. W. Phipps, of Midland Works, No. 15, Harborne, Birmingham. A study of such a work of art would, I am sure, immediately make the person who could not tell a swan from a fowl catch the hen-fever. I have always been a strong advocate for clever and persistent advertising, and I admire any advertiser who meets his clients just before the gate and helps them over the stile by means of a well-illustrated and descriptive catalogue.

Many there are who send for a catalogue but do not stop to think, when perusing it, how heavy the cost of its production must have been. Take, for instance, the catalogue I am referring to. The advertiser's specialities must be "extra" to warrant a 150-page art catalogue, each copy of which takes 3½*d.* in stamps for postage, and an envelope $10\frac{1}{2}'' \times 8''$. In the present volume I have dealt very fully with up-to-date poultry-raising, advocating a more progressive campaign for "Home" producers, and laying stress on the need for scientific housing. Mr. Phipps' specialities must include over a hundred designs of poultry accommodations, from the cockerel-box I have so strongly recommended to the Mammoth Intensive House. I have in this work given it as my candid opinion that no poultry farm can be complete without one or more of these Intensive Houses and given common-sense arguments to warrant my views. In the raising of chickens incubators and foster-mothers are essential to success, and by using such an

Nulli Secundus

(Second to none).

Quality Our Leading Feature Always.

ESTABLISHED nearly **HALF A CENTURY** ago we have successfully catered for the wants of Poultry Fanciers all over the United Kingdom, and have gained the confidence and support of a well-satisfied clientiele, increasing in number and volume of trade annually.

We specialise in **FEEDING-STUFFS OF ALL KINDS,** giving closest prices and utmost value always.

In addition to our Standard **WAVERLEY LAYING MEALS & DRY MASH** of a 1 to 4½ Ration, we make up meals compounded to any formulae by Breeders and faithfully produce these of best possible available foodstuffs. As prices of all items are constantly changing we are prepared to quote prices delivered to any Port or Station in the United Kingdom.

Our No. 1, 2 and 3 **DRY CHICK FEEDS & FRAME FOOD MEALS** are unexcelled for quality and price and are graded to suit all ages from the shell onward.

We use neither damaged nor inferior grains or meals in any of our many feeding stuffs.

We stock **CLOVER MEAL, FISH & MEAT MEALS** for prompt delivery.

'We Challenge the World for Grit'

Our Gold Medal **"VIGORINE" GRIT** has been known and used since 1870, and has been pronounced by well-known Breeders as being the "World's Best Grit." Those using it in 1870 are using it in 1918, which speaks volumes in its praise, and the ever-increasing demand demonstrates its popular use. We probably now supply nine-tenths of the Grit used in the British Isles. It is a perfect masticator and digestive, and prepares the food by the process of Ingluven for assimilation into the system for best results. Being rich in minerals, it provides all that is necessary for the Feathered Creation, and oyster shell is not required where it is adopted continuously, and shell-less eggs are unknown.

It is prepared for all Breeds and graded for all ages from the shell onwards. It is also graded for all members of the Feathered Tribe and sent out fit for the finest foreign finch to the size required for turkeys.

It has stood the **TEST OF TIME,** and fanciers are our best commercial travellers (of whom we have none) by their spontaneous recommendation.

Prices Carriage Paid in Free Sacks	In Scotland	7/- per cwt. ;	4/- per ½-cwt.
	In England and Wales	8/- "	4/6 "
	In Counties South of London, Ireland, & all the outlying Isles,	9/- "	5/- "

WE STOCK NUMEROUS ITEMS IN APPLIANCES.

Correspondence invited on all matters relating to Poultry.

DOBBIE & CO., Waverley Works, **LEITH.**

Telegrams: "Appliances, Leith." A.B.C. 4th and 5th Edit.

(JOHN DOBBIE, Senr., Sole Partner.)

Telephone: 358 Leith. Reuters, "Quellgrund."

incubator as the Phipps' "Perfection," with 97 gold and silver medals to its credit, one can naturally expect a high percentage of chicks with a low percentage of dead-in-shell. In scientific egg-farming, too, I have laid stress on the full use of trap-nests and marking rings, and these have their place in Mr. Phipps' catalogue. There are few firms that could on receipt of a wire equip a poultry-farm with plant at a moment's notice, yet my experience of Mr. Phipps' ability in this direction amply proves to me that such a task would be as simple as A, B, C.

The small poultry-keeper, too, can be fully accommodated by Mr. Phipps, no matter what his requirements may be. Many smart types of Backyard Intensive structures are supplied. Every appliance emanating from this progressive firm is bang up to date, and new numbers are constantly being added to keep up to the times. Amongst these is the "Ironstone" incubator, which is a perfect model for construction, workmanship and price. Write for current catalogue to-day!

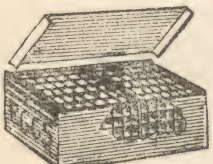
Bred-to-lay Strains.—Any one starting poultry-keeping should always purchase high-class birds or eggs from bred-to-lay strains. As I write I have before me the results of the Burnley 1914–15 Laying Contest, and here I find Mr. G. B. Metcalfe's name at the head. His six White Wyandottes in the 48 weeks laid 1254 eggs of a market value of £6 10*s.* 0½*d.* Mr. G. B. Metcalfe owns the Claydon Farm, Lechlade, Gloucestershire, where bred-to-lay strains in White 'Dottes, White and Black Leghorns, R. I. Reds, Anconas, all of which are noted laying breeds, are specialised in. In two successive years Mr. Metcalfe's birds were top-scorers in the three English Laying Competitions, an honour to be proud of and a testimony to the good-breeding of his laying-stock. In 1914 this breeder's White 'Dottes and White Leghorns respectively created a sensation in the Utility World of Poultry by winning both contests arranged by the Utility Poultry Club—a wonderful double event. Fourteen pullets in all were responsible for this record, and their average egg yield was over 220 eggs per pullet. Readers should remember that such heavy layers cost no more for feeding than (if as much as) hens averaging from 80 to 100 eggs a year. Any one can see at a glance, however, which of the two groups are the more profitable.

Use of Vinegar.—A spoonful of vinegar given at night to a table chicken about to be killed will result in a white and tender flesh. Vinegar if rubbed on the head-points of exhibition fowls will brighten them up. Not a few, too, dip a finger in vinegar and pass it round the centre of an egg just before it is due to hatch. This process helps the chick out.

The Hall Mark of Reliability in Egg Boxes, is

JAMES MARSHALL & Co. ABERDEEN

THERE are great opportunities ahead of the producers of Home Eggs. Don't miss your chance. The leading Egg Boxes used in every corner of the country by the leading egg handlers, are :—

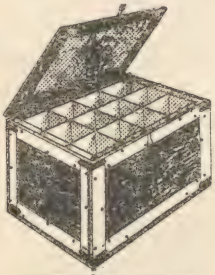


MARSHALL'S SIMPLEX
All Sizes, 1 doz. to 60 doz.

MARSHALL'S DUPLEX
All Sizes, 2 doz. to 60 doz.

MARSHALL'S PEERLESS
For 12, 15, 24 and 36 Eggs.

MARSHALL'S PREMIER
For 12, 24 and 36 Eggs.



MARSHALL'S VERILITE EGG BOX

MARSHALL'S PEERLESS
For 12 and 24 day-old Chicks.

These are the boxes used for carrying eggs to our wounded soldiers. They will also be of great service TO YOU—but be prepared, order a supply at once!

PATENTEE & MANUFACTURER:

Telegrams: "*Halycon.*"

JAMES MARSHALL,

12, Regent Quay,

ABERDEEN.

Telephone: *169.*

Tommy's Mother as a Layer.—Every progressive poultry-keeper should realise that it costs no more to feed a 200-egg hen than a mongrel layer; yet look at the extra profit in the former case. Again, every progressive poultry-keeper, as I have pointed out, should pay especial attention to the size of the egg, for 200 ounce eggs are no better than 100 two-ounce eggs. At the moment I am thinking of seven Rhode Island Red pullets that laid 1281 eggs in an official Ten Months' Laying Contest at the Harper Adams College, 1280 OF WHICH WERE FIRST-GRADE. These wonderful layers were bred and owned by Mr. W. M. Golden of Eaglesfield P.F., Leire, Lutterworth. Mr. Golden uses over 200 trap-nests daily, and specialises in heavy-laying pedigree White Wyandottes, White Leghorns, as well as single-comb Rhode Island Reds. Importance is attached to the male birds used, which are from heavy-laying mothers—a secret egg-specialists have discovered to their benefit. This highly successful breeder has patented one of the best styles of trap-nests I have ever had the pleasure of seeing, and all interested in egg-production will benefit by having his *post free* poultry brochure. Mr. W. M. Golden has in his endeavour to improve the laying power of his strains never omitted to strengthen the stamina of the birds. He has gone all out for size of egg, too, as well as quantity. In the Harper Adams College Laying Contest his White Leghorns were put to the test as regards stamina and were not found wanting. They won 1st and gold medal and represented the only pen to stand against the very severe outbreak of diphtheric roup, thus exhibiting their remarkable stamina.

For Table Chickens.—To make table chickens put on flesh always keep a piece of linseed oilcake soaking in the water used to mix up the soft food.

Visiting Poultry Farms.—Elsewhere in this volume I have called attention to the education to be derived from visits to poultry-farms. No poultry-keeper when in the vicinity of Orpington, Kent, should miss calling upon Mr. W. H. Cook, whose farm is but two minutes' walk from Orpington Station. The farm is excellently planned and a splendid view of the pens can be obtained from the railway. Often have I seen passengers jump up from their seats and run to the carriage door as the train nears Orpington just for a glance or two at the pens and birds on Mr. Cook's farm. Practically every variety of poultry is kept in stock, and Mr. Cook pays as much attention to a 5*s.* order as to a £100 one. There are not many poultry-breeders who could supply thousands of birds if wired to do so, yet Mr. Cook specialises in stocking poultry-farms. His export trade is a very extensive one, and as showing the enterprise of this breeder, a branch-establishment

MRS. GOODWIN PREECE

Crosshill Farm, nr. Shrewsbury.

(M.N.U.P.C. & N.U.P.C.).

Specialist Breeder of High-Class Utility

WHITE WYANDOTTES LEGHORNS ORPINGTONS

WHITE WYANDOTTES: 311 Egg Strain.

MY pens this season will include birds from the leading pens in the Harper Adams Laying Competition:—Pen 98 that averaged **252 eggs per bird.** Pen 60 average **231½ per bird.** Pen 19 average **257 eggs per bird.** My own birds won Bronze Medal and Certificate, 1912–1913, with **1,005 eggs.** In 1914–1915 Laying Competition my pullet 138 was top bird for winter months, laying **74 eggs in 84 days;** the pen owing to immaturity of two birds only finished 8th. A sister of pullet 138 laid **305 eggs** and another **307 eggs.** In 1915–1916 Competition my birds obtained 6th and 10th position. 1916–1917 results not yet to hand, but both at Harper Adams and Burnley (only 5 birds) my birds are in the first 6 numbers.

WHITE LEGHORNS: 314 Egg Strain.

THIS season my stock birds will include cockerels and pullets that were sired by sons of the world's record hen "Lady Eglantine," her official egg record being **314 eggs in 12 months,** at the North American Laying Competition, 1914–1915. Also Padman's Leghorns imported direct to me August, 1915 and 1916; the sires are sons of 306 egg hen.

Market Harboro'.
"The six Leghorn pullets we had from you have laid 1166 eggs in the exact 12 months, so we are very pleased."—
MRS. BENNETT.

Duleek, Co. Meath.
"The White Orpington cockerel I had from you was splendid, and made a most marked improvement in the laying of my Orpingtons."—
A. GOODMAN.

HUNDREDS TO HAND LIKE THIS.

Taddington, via Buxton.
"On April 14th I received two dozen day-old White Dotte chicks from you. The pullets started laying on Nov. 1, and the ten birds during last month (Feb.) laid 211 eggs, an average of 21·1 per bird. During the last days I have had 56 eggs or 8 eggs a day from the ten birds. I reside 2100 ft. altitude, and my croft faces due north. The snow for weeks has been 3 ft. thick with keen east wind."—D. M. M.

Bewdley.
"Both my White Dottes and White Leghorns were quite phenomenal layers. They averaged a steady 20 eggs a month all round."
—F. H. McC.

Armagh.
"I hatched 14 chicks from the 15 eggs (one dead in shell). This was remarkably good considering the long journey. They are doing splendidly."—H.

WHITE ORPINGTONS: 260 Egg Strain.

I HAVE a grand flock of these noted layers of brown eggs. Records, **260 to 241,** etc. Also 1st prize winners, Harper Adams College.

ALL BIRDS TRAP-NESTED A FULL 12 MONTHS.

HIGH PEDIGREE COCKERELS a speciality. These are reared on free range of over 200 acres and are guaranteed bred from hens with records, **314, 311, 307, 306, 305, 301, 300, 292, 288, 276, 272, 260 eggs in 12 months.** No sire will be used this season from less than a **260 egg hen.** Prices **21/6** to **42/-.** Very special birds, prices on application

EGGS—10/6 to **42/-. CHICKS**—February and March, from **30/- doz.**; April, from **21/-** (unfertiles and dead on rail replaced once).

Lists Free.
Telegrams—"Preece, Crosshill, Shrewsbury."
Telephone—207.

Correspondence Invited.
Station—Shrewsbury.
Bankers—Lloyds, Shrewsbury.

Pupils Taken.

Terms on Application.

has been fitted out at Le Touquet, France. In their unsuccessful rush to Paris the Huns almost reached the Le Touquet Buff Orpingtons; but our Tommies drove them back and so saved the stud fowls to continue their good work in the Continental Poultry World. The farm at Le Touquet will, I am sure, do wonderful work in restocking Europe with fowls after the War.

Vive la France!—A breed that poultry-keepers would do well to give a trial is the excellent La Bresse. This is the most popular breed of fowl in France, and justly so as it combines remarkable laying powers with the most delicate of flesh. Other points in their favour are that they (1) mature very early, (2) are small eaters, (3) are untiring foragers, and (4) are hard to beat for utility purposes. I have often inspected the stud of Black La Bresse owned by Mrs. Longueville, of Oerley, Oswestry, and this well-known lady-fancier has been most successful both on the bench and in the egg-basket with the Blacks, securing regularly French-imported original stock.

What do you require?—It very frequently happens that you need a certain appliance or accessory but throw the matter over in disgust because the many channels you tap cannot supply. The next time this happens send a letter to Mr. Harry Hebditch, Martock, Somerset. It is an address you can easily memorise, and it will pay you to do so. Anything and everything required by the poultry-keeper is supplied by this manufacturer, from a toe-puncher up to a mammoth Intensive house. All the accessories required by the breeder of pedigree utility poultry are specialised from the trap-nest upwards. Mr. Hebditch's catalogue is a book in itself, and of supreme educational value, and it should be given a place in every poultry-keeper's library. Poultry foods of every description are also supplied and poultry-keepers here have the advantage of ordering in bulk and saving considerably in the matter of their food-bills.

Value for Money.—If you are interested in pedigree trap-nested White Wyandottes and Light Sussex you can be sure of value for money from Mr. M. W. Slade of Mallard's Court, Stokenchurch, Oxon. Money is refunded for all unfertile eggs, 75 per cent. of all fertile eggs not hatching are replaced once at half-price, and all stock birds are sent on four days' approval. This breeder aims at producing birds of undoubted stamina, combined with good paying laying qualities, not only as pullets but for their second and third seasons. In these days when pedigree stock cost money their period of activity is a very important factor and Mr. Slade has many instances where his birds have laid more eggs in their second season than their first. Such is his reward for going all out for constitution.

That little Wattled Hurdle

WILL SAVE YOU POUNDS

and yet it costs less than two shillings.

MORE EGGS

If the lower half of partitions to wired-in runs consists of these Wattled Hurdles you will get more eggs. They protect the layers from all ground winds and are imperative on all exposed sites and on all poultry establishments in the winter.

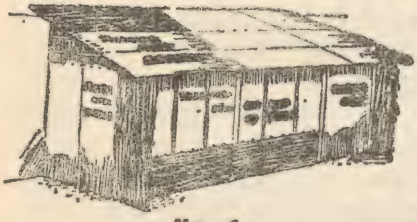
BETTER FERTILITY

¶ These Wattled Hurdles, too, prevent fighting between the inmates of one run and those of the next. The peace of the poultry yard is ensured, with better fertility as the result, and fewer deaths. Breeding hens are fully protected in all weathers and hatching percentages are increased thereby.

MORE CHICKS

Mortality among chickens is reduced to a minimum by the judicious use of these hurdles in the rearing grounds. Fix Wattled Hurdles on exposed side of hen-coop and chicks or foster-mother, and the well-doing of the latter will be ensured. They can be readily erected to provide shade and can be matched if desired.

WATTLED SHEDDING.



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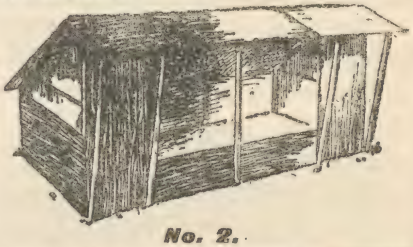

No. 2.

¶ Wattled Shedding represents the new economic housing system for poultry, and above will be found two useful designs. **No. 1,** measuring 12 ft. long × 6 ft. deep × 7 ft. high, sloping to 6 ft., costs only **£1 7s. 0d.,** whilst the same house, 18 ft. × 9 ft. deep costs but **£2 2s. 0d. No. 2** structure is on the same lines as the scratching shelter recommended by the author, and illustrated on page 144 of this book, measuring 12 ft. long × 6 ft. deep × 6 ft. high in front, it costs only **£1 10s. 6d.,** and 18 ft. long × 6 ft. deep × 6 ft. high in front, **£2 2s. 0d.,** whilst any other size in multiples of 3 ft. will be quoted for.

¶ There are a hundred-and-one ways of utilising our **WATTLED HURDLES** and **WATTLED SHEDDING,** and if you keep

POULTRY, PIGS, DOGS, CALVES, etc.,

please send a postcard at once for particulars and illustrations of all the good things we have to offer you. Address:—

RURAL INDUSTRIES, Ltd.,

54, Gracechurch Street, LONDON, E.C. 3.

Judicious Matings.—In "Willink's Wonderful Winter Layers" we have the product of judicious matings of best birds obtainable. It has been Mr. D. Willink's system to buy males or females from all the record layers as their performances became public. No expense has been spared, as the breeders have nominated the prices desired. With such birds quartered at the Bungalow P.F., Butts Green, Sandon, near Chelmsford, Essex, Mr. Willink has by special and judicious mating-methods evolved what can rightly be termed a "new" strain, that is "something different," and just the blood-channel from which poultry keepers can seek fresh-blooded stock. No bird of less than 240 egg strain is kept, and all breeding birds are kept in small flocks in spacious runs ensuring maximum fertility and hardiness. Here are the breeds kept with their egg-strains :—Buff Orpingtons, 260–265 ; White Orpingtons, 240–259 ; White Wyandottes, 285–311 ; and White Leghorns, 262–285. In addition to keeping pedigree poultry Mr. Willink also specialises in heavy laying Buff Orpington and White Runner Ducks, and first-crosses between them. The Orpington Ducks are of a 260 egg-strain, and the White Runners 295 egg-strain.

Cleanliness in Housing.—You may be ever so careful in getting the right plant, the proper birds and the correct foods, but you will be gazing at empty egg-baskets if you do not go just one step further. Here I refer to clean housing, which is absolutely imperative if the results are to be successful. "Sanitas" specialities immediately suggest themselves, and all progressive poultry-keepers should send to Messrs. Sanitas Co., Ltd., Limehouse, London, E. 14, for their *post free* leaflet and egg-recording sheet. The leaflet is full of valuable hints on poultry housing, telling how to keep ailments from the roost. Their Sulphur Candles should be freely used for fumigating houses particularly where there has been any outbreak of disease. For disinfecting purposes "Okol" calls for attention, and Sanitas "Distemper" for whitening should be widely used in every backyard house and run, and on the poultry farm. It is especially recommended for the walls of poultry houses, farm buildings, Intensive structures, food-houses, incubator houses, etc. One cwt. will cover about 400 to 500 yards of surface, and it can be supplied in any shade.

492 Eggs in 16 Weeks.—492 eggs in 16 winter weeks was the record put up by six White Wyandotte pullets owned by Mr. John E. Shackleton, Cholesbury, near Tring, Herts, in the Harper Adams Laying Contest. You will agree that this is a record to be proud of, and seeing that the birds form the basis of Mr. Shackleton's strain of White Wyandottes, you will naturally desire from him some sittings or chicks. This breeder goes all out for size and quantity of egg, and

MRS. COOPER

Culland Hall, BRAILSFORD, DERBY,

REFERS ENQUIRY RESPECTING HER RENOWNED ROSE-COMBED RHODE ISLAND REDS Also S. C.'s

to MISS CHAMBERS, Manager, Coney Green Poultry Farm, GROVE, RETFORD, NOTTS.

And offers Birds from **FOUR YEARS' CONSECUTIVE PALACE AND CLUB SHOW WINNERS.**

- 1st and 2nd PALACE, AND CLUB SHOW, 1910—"Fearless," "Bloodred Banner," and "Jack Cannock."
- 1st, PALACE AND CLUB SHOW, 1911—"Redskin" and "Rufus."
- 1912—"Swank Jack," "Red Ensign," & "Royal Standard."
- 1st, 2nd and 3rd PALACE AND CLUB SHOW, 1913, 4th, PALACE AND CLUB SHOW.

1st, 3rd and 4th in Cocks, and again in Cockerel Classes.
And Purchased 1st and Special Pullets, PALACE, 1913.

Having won 1st and Specials with a home-bred S.-C. Cockerel at the DAIRY SHOW, 1914, and bought the 1st, Specials and Cup-Winner (best "Red" in Show) at the last Crystal Palace Show—110 Birds of both Combs competing, *MRS. COOPER* now stands pre-eminent in both SINGLE-COMB and ROSE-COMB Rhode Island Reds, and has the most famous and best known Red Breeding Establishment in the Kingdom.

BIRDS AND EGGS IN SEASON.

NOTE. *The whole of MRS. COOPER'S Stock has been taken over at GROVE, and every effort is being made to improve both the birds and their egg-production.*

hardiness of chicks, and starts incubation as early as December in each season. He sets his broodies out in the open from December, and executes his orders for chicks from these broodies thereby obtaining vigorous day-olds, which will travel and give entire satisfaction. Over a 1000 head of breeding are kept, and the egg capacity also totals 1000. A tremendous trade is done in sittings as will be understood from the fact that on December 1st last Mr. Shackleton had booked orders for 5250 eggs for hatching (from satisfied customers of the previous year) for delivery in the coming spring. All the popular breeds are kept, and no order is too small or too large for sittings or chicks. Advice is given gratis on application !

Wattled Hurdles.—Wattled hurdles should always be kept in plenty on the poultry farm. They cost so little and yet can be employed in a hundred and one ways to increase the results and secure (1) more eggs, (2) better fertility, and (3) more chicks. Whether you keep poultry, pigs, dogs, calves, goats, or any livestock whatsoever, you will find wattled hurdles a boon. The Rural Industries, Ltd., of 54, Gracechurch Street, London, E.C. 3, specialise in wattled hurdles, and wattled shedding, illustrations of which together with the accruing advantages are given in their advertisement on another page. If you are out for more eggs, increased fertility and lower mortality, secure a good stock of these Wattled Hurdles.

Sound-shelled Eggs.—Every egg that is soft-shelled is, as I have pointed out, a dead loss to the poultry-keeper. It is unsaleable as a new-laid and unusable for incubation. You can only be sure of sound-shelled eggs by using shell *ad lib.* In like manner you can't get the best out of foodstuffs if you don't provide grit in plenty. Use what foods you may, their digestion is not possible unless the fowls have ample grit. This being so, you will send your order for grits and shell to Mr. Hugh Price, Midland Grit Co., Stourbridge, Worcs. Their prices are exceedingly reasonable, and their specialities widely and popularly used. Do not tinker about by buying grit and shell in small quantities ; it is too expensive. Buy in bulk and save money, as there is no expense in storing, and if you run out of shell down goes the egg-return. Help the fowls to do their duty by providing grit and shell *ad lib.*

2322 Eggs in 2 Years.—Two-year Laying Competitions have been so few and far between in the past, that to-day people examine the pullet-year results rather than those of the second season. This being so, the performance of the six White Wyandottes belonging to Mr. Edgar Watson, of Gate House Farm, Earby, near Colne, compels consideration. In the Harper Adams' Test these six pullets laid 1513

Pre-eminent Laying Strains

IN

RHODE ISLAND REDS (s.c.), WHITE WYANDOTTES and WHITE LEGHORNS.

Carefully bred for many years by the trap-nest, and unequalled as consistent winter layers of 1st grade eggs.

Breeder of England's Premier Competition R.I. REDS (s.c.). (1) ***Pen 44*** still holds ***the best official record ever made*** with the breed, *7* birds laying ***1,281 eggs*** in 10 months. (2) ***Gold Medal Winners Harper Adams 1915-16,*** sired by a cockerel bred and sold by me. (3) ***Pen 88*** won 3rd in the two years' section Harper Adams, one bird, ***250 eggs*** in 12 months. (4) ***2nd Prize Winners Irish Competition,*** sired by cockerel bred and sold by me. (5) ***3rd Prize Winners Harper Adams 1916-17*** bred from a breeding pen bred and supplied by me. **WHITE LEGHORNS—*1st and Gold Medal 1916-17 Harper Adams Competition (500 birds competing).*** This pen 9 finished ***£1 11s.*** ahead of any other pen, and withstood the worst outbreak of diphtheric roup ever experienced. Not a single bird in this pen was affected. **WHITE WYANDOTTES,** equally good, of the highest breeding.

I not only HAVE the best, but I SELL the best,

and if you require really tip-top stock do not fail either to call and see my birds or to write requirements. I can supply you with **prepotent** strains unexcelled for **stamina** and **breeding.**

Not Inbred Weakly Stock, but Stock which can be Reared.

Eggs for sitting from 15/- per sitting; Day-old Chicks double the price of eggs.

Catalogue on application—

W. M. GOLDEN, Eaglesfield Poultry Farm,

LEIRE, LUTTERWORTH.

Over 200 Trap-nests in daily use.

eggs in the 12 months, being gold medal winners and supreme champions. In the next Test at Harper Adams they again turned out supreme champions and special prize-winners, laying in the two-years' contest 2322 eggs. All the birds on Mr. Watson's farm are trap-nested and bred from individual hens specially kept for breeding. He breeds nothing but the best and therefore has nothing to sell but the best. Birds with the best winter records of *saleable* eggs are selected as breeders, and White Wyandottes are kept exclusively.

Weather-resisting Paint.— As paint and varnish manufacturers Messrs. Archibald Vickers, Ltd., of 28, King Street, Covent Garden, W.C. 2, have secured a reputation of which they may well be proud. Among their "tried" specialities is to be found the Vickers' Weather-resisting Paint, which should be freely used by all poultry-keepers. Depreciation in houses and plant is a very serious yearly item with poultry-keepers, and there is only one way of meeting same, and that is by the proper care of the appliances. Never whitewash your houses, says Mr. Archibald Vickers, without painting the woodwork first with two or three coats of his Weather-resisting Paint, allowing each coat from one to two days to dry off before the next coat is applied. Every year wash off the limewash with two or three good washings of water, give one coat of the Weather-resisting Paint, and proceed with the whitewash as usual. That is Mr. Vickers' maxim to make your chicken houses last your lifetime. This paint is sold in one tint only, viz. red-brown. When you paint your houses exteriorly remember that it is the oil in the paint that preserves the woodwork and keeps the water out. Good oil paint costs money, but costs no more for labour than common material in its application. Vickers' Weather-resisting Paint does the work and is the longest-life paint material in use. The expert services of this firm are at the disposal of readers for the asking.

Eggs, and still more Eggs.—Of late the "Gordon Gray" strains have come to the front in White Leghorns and White Wyandottes. Mr. G. Gordon Gray, Deansbrook P.F., Edgware, Middlesex, is mainly concerned in supplying (1) eggs that will hatch, (2) chicks that will thrive, (3) pedigree pullets that will lay, (4) cockerels that will "throw" heavy layers, and (5) breeding pens that will produce heavy-laying strains. Readers interested in profuse egg-production—*eggs, eggs, and still more eggs*—can safely put themselves in Mr. Gray's hands. Whilst quantity of eggs is aimed at, size of egg is not forgotten, and hatchability and rearability are distinctive features of the "Gordon Gray" strains. Every male used in the breeding pens is from a 200-egg-or-over dam, and every layer on the farm is trap-nested. No matter if

THE GRIT OF ALL GRITS

— IS THAT SOLD BY —

The Midland Grit Co.,

Stourbridge, Worc[illegible].

RECOMMENDED & USED BY the HIGHEST AUTHORITIES.

SEND STAMP — for — SAMPLE & Particulars.

CONTAINS:— *Lime, Iron-phosphate, Magnesia, — and Sulphur —* in CORRECT PROPORTIONS.

Prices:-

"N.S." Grit 5/- (PER CWT. CARRIAGE PAID.

"Crosshill" 5/9

Indispensable for EGG-production! A Most Valuable TONIC & HEALTH-GIVER.

The **Crosshill** is the **identical brand** used by **Mrs. GOODWIN PREECE,** upon which she has built up her wonderful **300 EGG STRAIN.**

PRICES.—CARRIAGE PAID.

Qualities—	28 lbs.	56 lbs.	1 cwt.	¼ cwt.	½ ton.	1 ton.
National Service	2/3	3/3	5/-	17/6	40/-	70/-
Crosshill.	2/6	3/9	5/9	20/-	48/-	80/-
Cockle Shell, Plain crushed.						
Ditto do. Chick size ...	2/6	3/9	5/9	20/-	48/-	84/-
Ditto do. mixed with C. H.						
Ditto do. riddled ⅛in. to ¼in. size ...	3/-	4/6	6/9	24/-	58/-	104/-
Ditto do. mixed with N. S.	2/6	3/6	5/6	19/-	44/-	80/-

This Composite Grit, as well as our National Service quality, is recommended by Captain Peirson-Webber, the well-known Director of the National Service Poultry Club, and one of the highest authorities in the Poultry World.

Special Quotations for Larger Quantities.

SAVE MONEY by BUYING IN BULK

Bags Free. **All Carriage Paid** to any Goods Station in England or Wales, Scotland, Ireland, or Isle of Wight, 6d., 9d., 1/-, 4/-, 7/6, 15/-, must be added to above prices. **Terms: Not Cash with Order.**

NO MORE SOFT-SHELLED EGGS.

THE MIDLAND GRIT Co., Stourbridge.

you are a hobbyist, backyarder, intensivist, or poultry-farmer, if your objective is eggs, eggs, and still more eggs, the "Gordon Gray" strains will help you. Sittings, chicks, stock birds, and breeding pens are the specialities.

Bred-to-lay Reds.—As a specialist breeder of the bred-to-lay Single-comb Rhode Island Red, Mr. W. Measures, Hargrave, Huntingdon, has met with great success. His birds have always performed well in the laying contests, as the following honours will show:—*Pen* 73, won 1st, gold medal, etc., at Harper Adams, 1915–16; *pen* 52, 1st for Reds at Burnley, 1915–16, and *pen* 66, 1st for Reds at Burnley, 1916–17. His "Red Queen" in the Harper Adams' Test put up a record of 260 eggs in the twelve months. In White Leghorns and White Wyandottes Mr. Measures has also been very successful in Laying Contests. In White Wyandottes eight out of nine pens entered by him in the Harper Adams Competitions 1915–16–17 finished with honours, a record that proves the even egg quality of the strain. Eggs for sitting and day-olds are the speciality, as are the "Hargrave" trap-nest houses and trap-nest doors to fit all nests, particulars of which are supplied gratis.

A Scottish Poultry Farm.—In the Romanno Bridge P.F., West Linton, Scotland, Messrs. Adams and Linkie own one of the best model poultry farms in the land. No expense whatsoever has been spared in laying down the plant and in stock. Covering over 120 acres, the farm is situated in the Pentland Hills, and the birds roam the Scotch heather-land and grass-land as in nature. This alone ensures the stamina and sturdiness of the stock kept and the progeny resulting therefrom. Black and White Leghorns, White Wyandottes, Buff Orpingtons, Rhode Island Reds, Light Sussex, Salmon Faverolles, etc., are the breeds specialised in, and no order is too small or too large. Eggs for hatching and day-olds are leading specialities, the incubator capacity being over 20,000, whilst thousands of chicks are hatched weekly in season. Pullets of any breed are raised to any quantity, and stock cockerels may be obtained in season. This farm should prove a boon to Scottish poultry-keepers in particular, and an inspection of the establishment is advised where possible.

When buying Cockerels.—Breeders of Single-comb Rhode Island Reds wishing to improve their laying strains should patronise Mrs. W. Beale, Manor House, Claybrooke, near Lutterworth. Her strain of trap-nested pedigree Reds is well known and has the closest blood-relationship to the most sensational pen of Reds ever entered in a Laying Contest, and also to the first and medal winners at Harper

Are you making Money from your Fowls?

There are *SCORES* of ways of keeping fowls, but only *ONE* correct and profitable way. May we put you on the right track?

THE "POWELL-OWEN" POULTRY BUREAU has been established to help poultry-keepers of all grades over the stile, and whether you keep 10, 100, or 1000 head of poultry, we can show you the nearest cut to successful poultry-keeping on money-making lines.

It is doubtful if any other poultry expert has a stronger following of the Poultry Public, or has written more poultry books of reference than our principal,

W. POWELL-OWEN

the author of this standard work.

JUST TO HAND.

"It gives me pleasure to testify to the very great value of your advice; you were instrumental in starting me in the Poultry Industry and your intimate knowledge of everything therewith has brought me success at every turn. Advice of the proper kind such as is yours, is all that is required by those desirous of making profit from their fowls."

W. S. L. (Caterham).

"It is a pleasure to correspond with you because, unlike several other writers on poultry, you understand the business end of the game as well as the journalistic side! The great mass of writers on poultry and poultry-keeping have never grafted the business idea on to their writing."

H. M. (Manchester).

Tuition by Post:—Special tuition by complete postal lessons. Courses comprise—(1) MODERN POULTRY-FARMING; (2) INTENSIVE EGG-FARMING; (3) HOW TO BREED AND MAINTAIN A 250 EGG STRAIN; and (4) TABLE-POULTRY FARMING. Full particulars and fees (moderate) free on application.

Express Postal Service:—If you require any practical advice we shall be glad to have a detailed letter from you, enclosing P.O. 2/6 fee, and take your case in hand at once. There is no phase of modern Poultry-Keeping we do not deal with, and Backyarders, Poultry-farmers, Small Holders, etc., needing sound and practical help are asked to write us, enclosing P.O. 2/6, and stating fully their difficulties, when we will gladly suggest a remedy.

The "POWELL-OWEN" POULTRY BUREAU

7c, BELSIZE PARADE, HAVERSTOCK HILL, HAMPSTEAD, LONDON, N.W.

Adams in 1916. The young stock are reared on a 320-acre farm, which ensures stamina and vigour in the stock cockerels and pullets purchased from this lady-breeder. Trap-nests are used and special care given to the big brown egg. Eggs for sitting, day-old chicks, stock cockerels, and pullets are specialised in, and in addition to Reds Mrs. Beale keeps White Wyandottes and White Leghorns of bred-to-lay strains. The performances of the inmates of the various pens are freely set out in the catalogue issued, so that one can judge the value offered.

Established Half a Century.—Established for nearly half a century the name of Wm. Cook and Sons, of St. Mary Cray, Kent, is a household one in every part of the globe where poultry matters are discussed. Originators of the Orpington fowls and ducks, these progressive breeders can supply in any numbers from a dozen day-olds up to a thousand head of adults. Thanks to their wide-world reputation they are extensive exporters of stock, and whilst practically every breed of poultry is kept, trap-nested strains are maintained. No order is too big or too small in sittings, chicks, stud cockerels, or pullets, or breeding pens. Those of my readers who contemplate keeping poultry should make an appointment with Messrs. Wm. Cook and Sons to inspect their beautifully arranged and extensive establishment at St. Mary Cray. Visitors are always welcomed, and much education will result from a visit to so noted a poultry farm. Messrs. Wm. Cook and Sons also specialise in poultry foodstuffs. Their "Ideal Meal" is used very extensively by both backyarders and poultry-farmers. It is supplied in two forms: (1) for use with 4 parts middlings, and (2) as a complete food. It may be taken for granted that such a world-renowned firm knows all there is to be learned about poultry-feeding, which in a measure has undoubtedly pushed their "Ideal Meal" to the fore.

CHAPTER XXII.

What Readers should Know.

HAVING at heart the interests of all of my readers, I would here like to call their attention to the important announcements which follow. I strongly urge a complete study of every page of this book from cover to cover, both text and advertisements, as considerable care has been bestowed on each and every folio.

When I wrote the first edition of my "Poultry-keeping on Money-making Lines" I took control of the advertisements and I have been entirely responsible for all announcements in subsequent impressions. My sole idea was to bar from the pages of the work those firms which I know to be unreliable. I have had a long experience on the business as well as the practical and journalistic sides of the Poultry Industry, and there is not a poultry firm or breeder in these Isles of whose credentials I am not fully aware. I set out originally with the idea that my text would be greatly weakened if any pages of the work carried announcements from doubtful persons, and I have continued with my plan.

In safeguarding my own interests I also protect my readers, whom I regard *primarily* as my pupils. The text matter has been prepared to point out to the novice the stepping stones to success and as so much depends upon a sound foundation and proper beginning, I cannot well afford to bring my novice-readers into touch with any firms or breeders who cannot give them satisfaction.

Every business announcement in this standard guide has been specially selected, most of the advertisers being personal and close friends of many years' standing. The Poultry Industry is too noble a national pursuit to be pestered as it really is with unreliable and fraudulent firms and breeders. We want every novice to meet with success from the start, so that he or she will be a credit to the Industry, and not a recruit to that disappointed army which says, "Poultry do not pay."

I urge every reader to use this widely-circulated guide as his or her everyday reference book, not only for the purpose of helpful advice, but also when desirous of purchasing eggs, chicks, stock birds, plant

or foodstuffs. Do not put the book aside when read, for reference only when the text is needed for guidance ! Take it down from the library shelf *every time* you intend buying anything connected with poultry-keeping ! Your interests will then be safeguarded and you will not be attracted by those cleverly worded advertisements which are but traps for the novice, and spell disaster.

When writing to advertisers in this book mention of my name and the title of the work will stand you in good stead. It is with deep sincerity that I have written these lines.

W. POWELL-OWEN.

PRINTED BY WILLIAM CLOWES AND SONS, LIMITED, LONDON AND BECCLES.

Robert Miller

DENNY, SCOTLAND.

THE LARGEST COMBINED POULTRY APPLIANCE MAKER AND POULTRY PRODUCER IN THE UNITED KINGDOM

SUPPLIES ONLY THE VERY BEST IN EVERYTHING. ROBERT MILLER'S INCUBATORS, BROODERS & POULTRY HOUSES, **STAND FIRST & FOREMOST—BEFORE ALL COMPETITORS.**

Robert Miller's Beautiful ART CATALOGUE is the Best Book on POULTRY & APPLIANCES in existence. SEND FOR IT NOW! IT IS POST FREE!

WHERE ROBERT MILLER'S APPLIANCES ARE USED, no others are tolerated. If you are not using Robert Miller's Famous Appliances, you are missing the SUREST ROAD TO QUICK SUCCESS IN POULTRY KEEPING.

THE "PRE-EMINENT" POULTRY HOUSE.

ROBERT MILLER'S FAMOUS NEW STYLE OF HOUSE FOR INTENSIVE, SEMI-INTENSIVE OR COLONY USE.

NOTE ROBERT MILLER'S ADDRESS—WRITE FOR HIS CATALOGUE.

ROBERT MILLER, DENNY, Scotland.

THE

Eaves "NEVERFAIL" Trap-nest

is the Trap-nest that defies competition—the Trap-nest that has gained a reputation for safe trapping no matter how nervous the birds are. It is

NEAT, SAFE, AND SIMPLE,

nothing to get out of order. It is used by many leading poultry-keepers who say it is the best Trap-nest they have ever seen or used. Thousands already sold to delighted customers. See the EAVES "NEVERFAIL" before you buy any other make.

A trial order no matter how small will receive my best attention and convince you that the EAVES "NEVERFAIL" has no equal.

Invented and made only by THOS. EAVES.

THOS. EAVES, 220, Eaves Lane,
CHORLEY, LANCS.

Write for Prices.

1513 EGGS IN 12 MONTHS

THAT was the record set up by my Six White Wyandottes in the Harper Adams College Laying Contest, 1915–16. This **Pen 98** were gold medal winners and supreme champions, averaging **252 Eggs per bird.** Also as **Pen 29** they were special prize winners and supreme champions in Harper Adams College 2-years' 1915–17 Laying Competition, with

2322 EGGS IN THE 2 YEARS

WHITE WYANDOTTES

MY **Pen 76** were bronze medal winners in Harper Adams 1916–17 Laying Competition, with

1163 EGGS IN 12 MONTHS

EGGS FOR HATCHING, CHICKS, & STOCK BIRDS

usually on sale at reasonable prices.

All birds are trap-nested and bred from individual hens specially kept for breeding. Birds with best winter records of saleable eggs selected. Breed nothing but the best, and so have nothing to sell but the best.

EDGAR WATSON, Gate House Farm, EARBY, nr. COLNE.

Trap-nested Pedigree Reds (S.C.)

EVERY utility poultry-keeper interested in heavy egg-production and desirous of full egg-baskets should try

SINGLE COMB **RHODE ISLAND REDS.**

My strain is noted for **big brown eggs** having the closest blood relationship to **Pen 44**, which in the Harper Adams 1914-15 Ten Months' Laying Competition laid

1281 EGGS 1280 of which were first-grade.

And also to **Pen 73**, which won **First and Gold Medal** at Harper Adams 1916 Laying Competition.

STOCK BIRDS A SPECIALITY!—A Speciality is made of supplying pedigree stock cockerels—splendid vigorous birds reared on a 320-acre farm. Just the sires you need to improve your laying strains.

EGGS FOR HATCHING
DAY-OLD CHICKS.

PEDIGREE STOCK
COCKERELS and PULLETS.

Prices and Catalogue from :—

Mrs. W. BEALE, Manor House, Claybrooke, Nr. LUTTERWORTH.

Improve your Laying Strain.

WHY BE BOTHERED WITH BROODIES?

Thousands of Pounds are wasted yearly by the use of Broody Hens for mothering chickens. A hen's duty is **TO LAY EGGS**, and it is the poultry-keeper's duty to keep every hen on Active Laying Service. Whilst a hen is in lay she is "in profit"; whilst broody she must be "out of profit." Build up a strain that will lay, and when the fowls are laying keep them at it. There is only one way of dispensing with Broodies and that is by the use of

Highly praised by Author of this Book.

Bond's

PATENT

The cleverest Invention ever produced.

Combined Incubator and Duplex Rearer

This clever invention enables you to hatch and rear your Chicks till they are SIX WEEKS OLD without the use of Broodies.

Bond's Patent Combined Incubator and Duplex Rearer is the most complete Hatching and Rearing Machine ever introduced to Poultry Breeders. It gives the best results at the lowest cost of production and the minimum of labour.

Every Progressive Poultry Breeder will write me TO-DAY for full particulars of this clever invention. It is a sure way of putting **POUNDS** into your pocket every season. Drop me a line without delay.
Address—

LEONARD BOND, 20 Dinting Lane, GLOSSOP, Derbyshire.

Mrs. W. B. Goode,

Aldborough Lodge
Boroughbridge
Yorks

Breeder, Exhibitor, and Exporter of

Single Comb Rhode Island Reds
:: -and White Wyandottes- ::

TWO OF THE MOST POPULAR AND MOST USEFUL BREEDS OF THE DAY.

BIRDS AND EGGS FOR SALE

Prizes won include—

1st Prize and Challenge Cup (Crystal Palace).
1st & Special Dairy. 1st & Medal "Royal."
1st, Club Show, York (R.I. Red), etc., etc.

Hundreds of Prizes won.

Member of Committee of the Rhode Island Reds Club. Member of White Wyandotte Club, The Poultry Club, etc.

Also Breeder of Pedigree Goats (Good Milking Strain).
Member of "The British," and "The Utility Goat Societies."

OSCAR BLAND'S
WHITE WYANDOTTES
2nd
Harper Adams Competition

ALL SECTIONS: ONE-YEAR TEST.

1916-17.

A STRAIN OF PROVED LAYING POWER.

STOCK BIRDS AND EGGS.

Catalogue on request.

THE FOSSE HOUSE, ETTINGTON, WARWICKSHIRE.

Your Best Service

IS WITH

R. TOOPE & Co.,

LONDON'S LEADING

Poultry Appliance Makers.

37 Years' Trading is a RECORD no other Firm can boast of, and the same high standard is continued, enhancing our already high reputation. Submit your requirements to us, and we will gladly quote for FULL or PARTIAL Equipment of POULTRY FARMS, Incubators, Poultry Houses, Coops, Brooders, and every requisite. Expert advice gladly given. Get our Free Catalogue. Send to-day.

R. TOOPE & Co.,

31, Stepney Square, High Street, Stepney, LONDON, E.

Nat. Tel. East 3497.

WHEN

I started in the **Rhode Island Red** Fancy I procured—regardless of expense—the highest-class exhibition specimens in both **Single Combs** and **Rose Combs.** I imported the best birds America could offer and by scientific mating and line-breeding, so "fixed" a strain from my noted English-bred winners and America's best that my **REDS** won

OVER 200 PRIZES IN TWO SEASONS.

Smalley Hall **REDS** were successful at all the leading Shows, including—Dairy, Palace, Royal of England, Royal Lancs., Haywards Heath, York, Birmingham, Manchester, Club Shows, etc., etc., and still hold their own at the Classic Events.

¶ The Rhode Island Red is without a doubt the most popular breed in Poultrydom. It has gone ahead by leaps since it was first introduced into this country from America, where it had already "won its spurs." Its popularity has been due to its all-round merits, for it is a splendid layer, an excellent table bird, and for beauty of plumage and contour it stands alone.

¶ The Rhode Island Red has also forged ahead because it has a "utility" standard, and by breeding to this for points the egg-producing merits of the breed are maintained.

Can Spare few Cockerels and Pullets in both Rose and Single Combs.

MRS.

ALFRED SWINGLER, SMALLEY HALL, DERBYSHIRE.

WILLINK'S WONDERFUL WINTER LAYERS

No birds of LESS THAN 240-EGG STRAIN kept.

The Product of judicious matings of best birds obtainable from Messrs. CAM, BARRON, Wm. COOK & SONS, Miss EDWARDS, &c.

BUFF ORPINGTONS, 260—265.
WHITE ORPINGTONS, 240—259.
WHITE WYANDOTTES, 285—311.
WHITE LEGHORNS, 262—285.

All breeding birds in small flocks in spacious runs ensuring maximum fertility and hardiness.

Can spare a limited number of sittings of any of above from 9/6 to 21/- per 13—price according to pen.

D. WILLINK, Bungalow Poultry Farm, BUTTS GREEN,
SANDON, Near CHELMSFORD, ESSEX.

Will You Please Turn to Chapter IX?

I am sure the Author's remarks on the Breeds I keep will interest you. I studied the question of "Breeds" very seriously before I stocked—

Sicilian Buttercups | **Blue Wyandottes** | **Rhode Island Reds**
Black Leghorns | **Black Wyandottes** | **White Leghorns**

Sicilian Buttercups. All my winners are "home bred" and have to their credit wins at all the principal shows.

Rhode Island Reds. Have won premier prizes at the leading shows; including club shows. Both Rose and Single Combs have won specials and challenge cup for best in show. Eggs from these pens have won prizes at local shows.

Blue Wyandottes. Birds in my pens have won 1sts at Leicester, Kenilworth, Knighton, Radnor, Carnarvon, Presteigne, Leeds, Dairy, Belper and Loughborough.

Black Wyandottes. My strain is one of the oldest in the country, and has many important honours to its credit.

Black Leghorns. My strain has been kept true for 15 years. Prolific layers of large white eggs, many averaging six to the pound.

White Leghorns. Utility only. Specially selected for egg-production, bearing in mind size as well as number of eggs.

Highly Successful Breeder, Exhibitor, and Exporter.

If you want all that is "**best**" in utility or exhibition strains please send me your enquiry. Export orders a specality!

Eggs, Chicks, and Stock Birds. *Correspondence Invited.*

MISS FRANCES CHAMPION Heather Hall, LEICESTER.

IT IS

EGGS THAT COUNT

from the poultry-keeper's view-point and

Correct Feeding

from that of the Layers.

You can get best flock averages by regularly using our celebrated "Clarendo" Malted Meals.

"MALTO" Malted Laying Meal.

A super standard food consisting of scientifically milled cereals blended in well-balanced proportions with malt extracts, granulated meat and "Vido," Clarendo and Malt Food Tonic. Middlings and Bran may be added.

"MALTASH" Malted Dry Mash

A standard food requiring no addition, but any scraps can be added and fed in a crumby condition. Contains Clover-meal, Meat, and Malt.

Both meals may be used for either dry or moist feeding.

Our foods have stood the test of many years, the ingredients are selected and blended in scientific proportions by an eminent poultry specialist, and thoroughly tested by experienced poultry men, so that the feeding properties can be relied upon.

WHITE, TOMKINS & COURAGE, Ltd.,

48, Mark Lane, LONDON, E.C. 3.

Samples sent free on application. *Also at* **LIVERPOOL and BELFAST.**

SEND NOW

Annandale Poultry Farm & School of Utility Poultry Culture

MRS. ST. JOHNSTON

(Member N.U.P.S.),

SUTTON COLDFIELD, nr. Birmingham.

PURE-BRED TRAP-NESTED BIRDS.
TABLE PIGEONS.
WHITE RUNNER DUCKS (TAYLOR'S).
TABLE RABBITS. GOATS. MILKING COWS.

A large proportion of the food is grown on the farm to save the food-bills.

DAY-OLD CHICKS. 1200 EGG INCUBATOR CAPACITY.
STOCK COCKERELS. VACANCIES FOR PUPILS.

3rd and 4th positions in Large and Small House Sections, Harper-Adams 1916-17 Laying Competition.

SEND FOR MRS. ST. JOHNSTON FOR ADVICE ON POULTRY, AND TO PLAN YOUR RUNS.

Telephone 103.

Station—SUTTON COLDFIELD, M.R. & L.N.W.R.

M. W. SLADE,

(Member of N.U.P.S. and S.P.B.A.)

Breeder of Pedigree Trap-nested

LIGHT SUSSEX & WHITE WYANDOTTES

(Mainly Rothschild) (Worcestershire Poultry Farm)

All pens are mated to produce stock of undoubted stamina, giving plenty of full-sized hatchable eggs.

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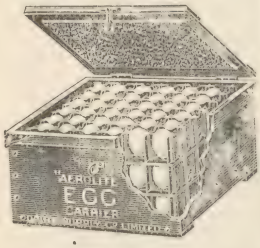

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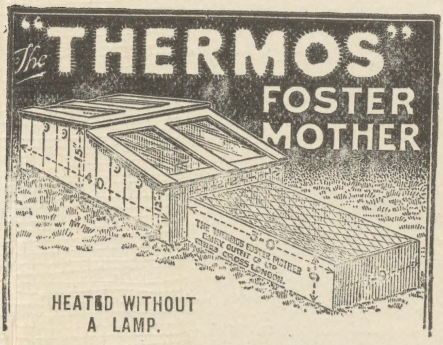

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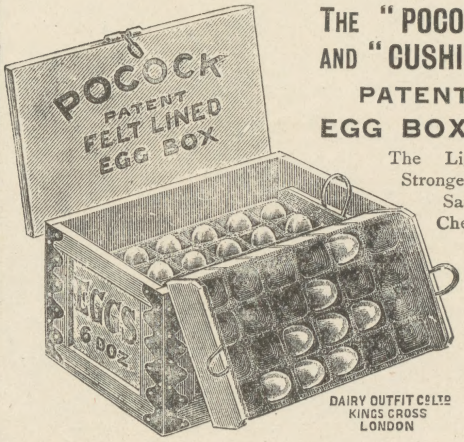

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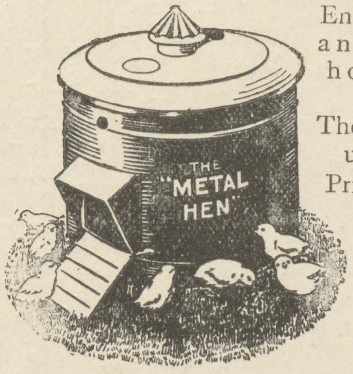

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